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RESEARCH MEMORANDUM

PRESSURES AND ASSOCIATED AERODYNAMIC AND LOAD
CHARACTERISTICS FOR TWO BODIES OF
REVOLUTION AT TRANSONIC SPEEDS

By Harold L. Robinson

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Langley Field, Va. *Unclassified*

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NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

WASHINGTON

March 11, 1954

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PRESSURES AND ASSOCIATED AERODYNAMIC AND LOAD

CHARACTERISTICS FOR TWO BODIES OF

REVOLUTION AT TRANSONIC SPEEDS

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SUMMARY

Analysis of the results obtained from a transonic wind-tunnel investigation of two bodies of revolution having the same nose shape, one incorporating a cylindrical afterbody and the other incorporating a curved afterbody, indicated that the pressures over the forward portions of the bodies were the same, whereas, the induced velocities over the rearward portions of the curved body were greater than those over the cylindrical body. However, the cross-section normal loads were greater over the rearward portions of the cylindrical body. Variation of the aerodynamic characteristics with Mach number was rather small for both bodies. The cylindrical body exhibits better stability characteristics than the curved body. The theory of NACA Rep. 1048 regarding the aerodynamic characteristics of the bodies is in fair agreement with the results of this paper.

INTRODUCTION

A detailed study of the pressures and resulting forces for a body of revolution, designated "curved body" in this report, at transonic speeds has been presented in reference 1.

The present tests were undertaken in order to provide aerodynamic load data for a body of revolution having an ogive nose and cylindrical afterbody and to compare the aerodynamic characteristics of this body with the body of reference 1 at transonic speeds. The body used in the present test is designated "cylindrical body" herein. A comparison of various theoretical aerodynamic parameters with experimental values is included.

The tests reported herein were made for a Mach number range from 0.6 to 1.13 and an angle-of-attack range from 0° to 20°. The Reynolds number

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range corresponding to the Mach number range varied from 3.3×10^6 to 3.9×10^6 per foot of length.

SYMBOLS

A_p	plan-form area of body
C_{M_F}	pitching-moment coefficient around the nose, based on maximum body cross-sectional area and body length
C_{N_F}	normal-force coefficient, based on maximum body cross-sectional area
c_{d_c}	section drag coefficient of an infinite cylinder
c_n	transverse section normal-force coefficient, $\frac{N_t}{qD \, d(x)}$
c_{nn}	meridian load coefficient, $\frac{N_n}{qLR_{max} \, d(\theta)}$
D	diameter of body at any station
L	length of body
M	Mach number
N_n	elemental force on meridian body section of width $R \, d(\theta)$ (force vector is normal to body axis and makes an angle θ with vertical plane of symmetry)
N_t	elemental force on transverse body section of length $d(x)$ (force vector is normal to horizontal plane of symmetry)
P	pressure coefficient
Q	volume of body
q	dynamic pressure
R	radius of body at any station
S_b	base area of body

x	distance from nose of model, positive rearward
x_m	moment center
x_p	centroid of body plan-form area
x_{cp}	center-of-pressure location
y	distance from vertical plane of symmetry
α	angle of attack
η	ratio of the drag coefficient of a finite cylinder to the section drag coefficient of an infinite cylinder at $\alpha = 90^\circ$
θ	meridian station, 0° at top
Subscripts:	
max	maximum value
L	lower surface
U	upper surface

APPARATUS AND METHODS

Tunnel

All the data discussed herein were obtained from tests conducted in the Langley 8-foot transonic tunnel. At present, this tunnel has a dodecagonal slotted test section and is capable of continuously variable operation through the speed range up to a Mach number of 1.14. A test section used previously in this tunnel did not incorporate slots, but had a closed throat. All the data for the cylindrical body and most of the data for the curved body were obtained from tests in the slotted test section. A small portion of the data for the curved body was obtained from tests in the closed-throat test section.

Tunnel-wall-interference corrections were not applied to the data obtained from tests in the slotted test section because choking and blockage effects are negligible, especially for the small ratio of model to tunnel size of the present tests. Effects of wall-reflected disturbances have been reduced by offsetting the model from the tunnel center line.

Bodies

A drawing of the two bodies is presented in figure 1. The cylindrical body has the same dimensions as body D of reference 2. The curved body is the same body as that used in references 1 and 3 and is similar to, but slightly longer than, body A of reference 2. Both the curved and cylindrical bodies have the same dimensions forward of the 20-inch body station.

Each of the models was instrumented with six rows of orifices spaced along meridians of the body. Each row contained 20 or more orifices. The relative size of the stings employed to support the model in the tunnel is indicated in figure 1.

Measurements

Pressure.- The pressures existing on the surface of the cylindrical body were measured by connecting the orifices to a multitubed manometer. In order to determine the forces on the model, these pressures were integrated as discussed in the section of this report entitled "Presentation of Results." The pressure data and associated aerodynamic parameters for the curved body were obtained from references 1 and 3.

The repeatability of the pressure data presented herein as affected by the pressure measurements, angle of attack, orifice size and location, and other factors may be judged from figure 2. The largest errors occur near the nose where they are as large as $\Delta P = \pm 0.015$. The accuracy is much better over the remainder of the body. The average error, as determined from the data presented in figure 2, is $\Delta P = \pm 0.005$.

Angle of attack.- The angle of attack for the cylindrical body was measured by an electrical strain-gage pendulum device mounted internally near the base of the support sting. Sting and model deflections occurring ahead of this point, due to forces and moments acting on the model, were determined from static tests. These corrections were applied to the angles of attack, although the maximum deflections occurring during the investigation were approximately 0.1° . The angles of attack were also corrected for the approximately 0.1° upflow existing in the Langley 8-foot transonic tunnel. The absolute accuracy of the angle-of-attack measurements is estimated to be within 0.1° .

PRESENTATION OF RESULTS

Pressure Coefficients

All the pressures measured for the cylindrical body are presented in table 1. The longitudinal distribution of pressure coefficients for the cylindrical body at 0° angle of attack is presented in figure 3. Also shown in this figure is the pressure distribution for the curved body from references 1 and 3. The longitudinal distribution of pressure coefficient at the other angles of attack are presented in figure 4 at three Mach numbers (approximately 0.8, 1.00, and 1.13).

Normal Force and Pitching Moment

A comparison of the normal-force and pitching-moment coefficients for the two bodies is presented in figures 5 and 6, respectively. All the data for the curved body were obtained from reference 1. In order to compare the pitching-moment characteristics of the two bodies, the moment coefficients were taken about the nose of the bodies.

The integral equation used to compute the normal-force coefficients for the cylindrical body was

$$C_{N_F} = - \frac{8L}{D_{max}} \int_0^{0.5} \cos \theta \left[\int_0^1 P \frac{D}{D_{max}} d\left(\frac{x}{L}\right) \right] d\left(\frac{\theta}{2\pi}\right)$$

and that used to compute the pitching-moment coefficient was

$$C_{M_F} = \frac{8L}{D_{max}} \int_0^{0.5} \cos \theta \left[\int_0^1 P \frac{D}{D_{max}} \left(\frac{x}{L}\right) d\left(\frac{x}{L}\right) \right] d\left(\frac{\theta}{2\pi}\right)$$

The coefficients presented at $\alpha = 20^\circ$ could have been lowered as much as 25 percent of the value shown by changing the fairings of the graphical integrations. However, the data presented for the cylindrical body agree with the strain-gage data presented in reference 2. The fairing choice does not exist at $\alpha \leq 8^\circ$ but this margin increases with angle of attack as the angle is increased from 8° .

The theoretical values of normal-force and pitching-moment coefficient shown in figures 5 and 6 were computed by the method described in reference 4. The equations for these coefficients may be written as follows:

$$C_{NF} = \frac{8S_b}{\pi D_{max}^2} \alpha + 4\eta c_{dc} \frac{A_p}{\pi D_{max}^2} \alpha^2$$

$$C_{MF} = \frac{8}{\pi D_{max}^2} \left(\frac{Q}{L} - S_b \right) \alpha - 4\eta c_{dc} \frac{A_p}{\pi D_{max}^2} \left(\frac{x_p}{L} \right) \alpha^2$$

The values of η and c_{dc} used in the calculations for the cylindrical body were 0.7 and 1.2 and were chosen from reference 5 and references 6 and 7, respectively. The plan-form area A_p , the body volume Q , and the location of the centroid of the body plan-form area x_p were determined from graphical integrations of suitable geometric parameters.

Center of Pressure

A comparison of the center-of-pressure locations for the two bodies is presented in figure 7. The data for the cylindrical body were computed from the normal-force and pitching-moment coefficients of figures 5 and 6. The center-of-pressure data for the curved body were obtained from reference 1.

Detailed Aerodynamic Loads

The meridian normal-load distribution is presented for three Mach numbers (0.80, 1.00, and 1.13) through the angle-of-attack range in figure 8. This coefficient c_{nn} is defined in such a manner that the load perpendicular to the fuselage center line on a stringer section $Rd(\theta)$ wide is $c_{nn}qL_{max} d(\theta)$. Accordingly, c_{nn} is computed from the graphical integration along a body meridian as follows:

$$c_{nn} = - \int_0^1 \frac{D}{D_{max}} P d\left(\frac{x}{L}\right)$$

The longitudinal distribution of body cross-section normal loads at $M = 1.00$ is presented in figure 9. The pressure data were computed by a graphical integration

$$c_n = \int_0^1 (P_L - P_U) d\left(\frac{y}{R}\right)$$

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The theoretical values of $c_n \frac{D}{D_{\max}}$ were computed by the method of reference 4. The equation for a body of revolution may be written as follows:

$$c_n = \pi \left(\frac{dD}{dx} \right) \alpha + \eta c_{dc} \alpha^2$$

DISCUSSION OF RESULTS

Pressure Distribution

The pressures over the nose of both bodies, forward of the 20-inch station, are very similar to each other through the range investigated (figs. 3 and 4). Some of the differences observed near the tip of the nose are due to slight differences in the body shape at the apex. In general, the pressures over the rearward portions of the curved body are lower than those over the rearward portions of the cylindrical body. The typically characteristic rearward movement of the shock location with Mach number increases may be observed in figure 3. At $M = 0.99$ the shock is located at approximately the 20-inch body station of the cylindrical body, whereas at $M = 1.03$ the shock has moved to the 37-inch body station.

The compressions shown for the cylindrical body in figure 3 at $M = 1.08$ and 1.10 at approximately the 30- and 34-inch stations, respectively, are probably due to the bow wave reflected from the tunnel wall and would not be evidenced in free flight. The expansions seen at the rear of the cylindrical body are caused by the air turning around the corner.

Normal-Force Characteristics

As shown in figure 5, the cylindrical body develops greater normal force at a given angle of attack and Mach number than the curved body. The change in normal-force coefficient with Mach number is insignificant at the lower angles of attack, but there is a small increase in normal-force coefficient with Mach number at the higher angles of attack.

The prediction of the normal-force coefficients by the method of reference 4 is rather accurate at the lower angles of attack. In general, the measured values fall well below the theoretical values at the higher angles of attack. As mentioned previously, alternative fairings permissible for the integrations would result in even lower values for the measured data. The cross-flow Mach number is less than 0.4 at the highest

stream Mach number and at an angle of attack of 20° . Accordingly, the values of c_{d_c} are constant. Therefore, the theory does not predict the variation of normal force with Mach number shown by the measurements.

Pitching-Moment and Center-of-Pressure Characteristics

Examination of the pitching-moment data (fig. 6) indicates that the curved body exhibits either neutral or slightly unstable characteristics for the center of gravity at the nose or unstable characteristics for more rearward locations of the center of gravity. The cylindrical body exhibited more stable characteristics inasmuch as the center of pressure is located behind the 12-inch station for all conditions. It is also noted that the variation of the center-of-pressure location with Mach number is irregular and small (fig. 7).

The agreement of the measured pitching-moment coefficient with the theory is similar to that found for the normal-force coefficients. In general, when the normal-force coefficients are overpredicted, the negative pitching-moment coefficients are also overpredicted. Examination of the equations for C_{N_F} and C_{M_F} , given in the section entitled "Presentation of Results," indicates that the probable cause for the disagreement noted between the measured and predicted coefficients is associated with the values selected for η and c_{d_c} . Had lower values of c_{d_c} and η been used the agreement would have been better.

Detailed Load Characteristics

The maximum meridian load is developed at approximately the 105° meridian (fig. 8). It is observed that the loads do not vary appreciably with Mach number.

Examination of figure 9 indicates that although the cross-section normal loads over the forward portions of both bodies are similar, the loads over the rear portion of the cylindrical body are greater than those for the curved body. This is the reason that the pitching-moment characteristics of the cylindrical body are more stable than those for the curved body. The differences observed between the normal-force and pitching-moment characteristics for the two bodies are not caused by the added length of the cylindrical body.

Comparisons of the measured and theoretical values of cross-section normal-load coefficient indicate that the theory is in fair agreement with the measured values at angles of attack below 12° . The theoretical values show the same agreement at the forward and rearward portions of the cylindrical body. It is concluded that the errors between theory

and measurement for the cylindrical body at the higher angles of attack are due to the inadequacy of available data for selecting η and c_{d_c} . The disagreement between the theory and the measurements at the rearward end of the curved body may be due to sting interference. It should be noted that, at angles of attack above 12° , integration of the curves of figure 9 does not give as large a value for C_{N_F} as those plotted in figure 5. The data presented for the cylindrical body in figure 9 have been faired consistently with the data of reference 1, whereas the data of figure 5 agree with the strain-gage data of reference 2.

CONCLUSIONS

Analysis of the results obtained from a transonic wind-tunnel investigation of two bodies of revolution, one incorporating a cylindrical afterbody, the other incorporating a curved afterbody, indicates:

1. The pressures over the nose of both bodies are very similar although higher induced velocities exist over the rearward portions of the curved body; however, the cross-section normal-force coefficient is greater over the rearward portions of the cylindrical body.
2. At a given Mach number and angle of attack, the normal-force coefficient for the cylindrical body is greater than that for the curved body.
3. The center-of-pressure location was more rearward for the cylindrical body than for the curved body. Consequently, the cylindrical body exhibited more desirable stability characteristics.
4. The variation of normal-force and pitching-moment coefficients with Mach number is rather small, especially at the lower angles of attack.
5. The maximum meridian load for the cylindrical body occurs at approximately the 105° meridian.
6. The theoretical normal-force and pitching-moment characteristics of both bodies are in fair agreement with the results of this investigation.

Langley Aeronautical Laboratory,
National Advisory Committee for Aeronautics,
Langley Field, Va., December 9, 1953.

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TABLE I
PRESSURE DATA, CYLINDRICAL BODY

(a) $M = 0.60$

x, in.	Pressure coefficients at row -																		
	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 180^\circ$	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 180^\circ$	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 180^\circ$	
	$\alpha = 20^\circ$						$\alpha = 16^\circ$						$\alpha = 12^\circ$						
0.50	-0.053						-0.002						0.027						
1.50	-0.062						-0.093						-0.025						
2.50	-0.057	-0.265	-0.304	-0.221	0.078	0.126	-0.043	-0.158	-0.187	-0.100	0.109	0.300	-0.051	-0.089	-0.094	-0.025	0.113	0.235	
3.50	-0.067						-0.051						-0.056						
4.50	-0.070	-0.161	-0.242	-0.268	0.009		-0.058	-0.141	-0.218	-0.141	0.41		-0.046	-0.097	-0.127	-0.071	0.04		
5.50	-0.074						-0.060						-0.051						
6.50	-0.053	-0.193	-0.334	-0.298	-0.099	0.193	-0.069	-0.141	-0.228	-0.179	-0.007	0.173	-0.059	-0.106	-0.140	-0.105	0.012	0.121	
8.50	-0.058	-0.142	-0.326	-0.300	-0.065	0.156	-0.049	-0.126	-0.230	-0.190	-0.052	0.145	-0.045	-0.105	-0.146	-0.110	-0.008	0.092	
10.50	-0.058	-0.158	-0.308	-0.304	-0.089	0.151	-0.040	-0.112	-0.224	-0.205	-0.051	0.121	-0.042	-0.095	-0.147	-0.121	-0.022	0.080	
12.50	-0.048	-0.150	-0.280	-0.305	-0.092	0.146	-0.056	-0.102	-0.209	-0.202	-0.069	0.109	-0.034	-0.080	-0.159	-0.121	-0.022	0.065	
14.50	-0.046	-0.124	-0.292	-0.308	-0.106	0.124	-0.059	-0.096	-0.198	-0.211	-0.079	0.079	-0.028	-0.075	-0.140	-0.131	-0.045	0.044	
16.50	-0.047	-0.118	-0.216	-0.301	-0.113	0.125	-0.056	-0.084	-0.176	-0.211	-0.086	0.077	-0.020	-0.065	-0.129	-0.130	-0.049	0.044	
17.17	-0.090						-0.057						-0.017						
18.17	-0.058	-0.105	-0.191	-0.294	-0.115	0.127	-0.057	-0.077	-0.156	-0.205	-0.088	0.070	-0.016	-0.056	-0.118	-0.124	-0.050	0.059	
19.17	-0.046						-0.027						-0.005						
20.17	-0.058	-0.099	-0.167	-0.285	-0.106	0.132	-0.056	-0.072	-0.136	-0.194	-0.082	0.076	-0.011	-0.044	-0.104	-0.114	-0.044	0.048	
21.17	-0.056	-0.175	-0.272	-0.100	---	---	-0.052	---	---	---	-0.073	---	-0.006	---	---	-0.111	-0.110	-0.055	---
22.17	-0.050	-0.094	-0.164	-0.266	-0.097	0.136	-0.048	-0.069	-0.132	-0.181	-0.079	0.080	-0.006	-0.058	-0.096	-0.102	-0.056	0.053	
23.17	-0.026	-0.149	-0.260	-0.096	---	---	-0.024	---	---	---	-0.117	---	-0.004	---	---	-0.095	-0.101	-0.052	---
24.17	-0.027	-0.091	-0.253	-0.092	0.135	---	-0.022	-0.057	---	-0.168	-0.069	0.080	-0.005	-0.034	-0.099	-0.099	-0.048	0.054	
25.17	-0.029	---	-0.256	-0.095	---	---	-0.024	---	---	-0.168	-0.067	---	-0.008	-0.079	-0.100	-0.028	---	---	
26.17	---	-0.088	-0.248	---	0.137	---	-0.055	---	-0.160	---	---	0.078	---	-0.051	-0.093	-0.093	-0.020	0.052	
27.17	-0.026	-0.119	-0.254	---	0.138	---	-0.019	-0.103	-0.167	---	-0.053	---	-0.009	-0.032	-0.096	-0.096	-0.054	0.054	
28.17	-0.028	-0.089	-0.107	-0.251	---	---	-0.018	-0.051	-0.167	---	-0.076	---	-0.011	-0.032	-0.096	-0.096	-0.054	0.054	
29.17	-0.024	-0.078	-0.084	-0.251	-0.081	0.140	-0.021	-0.046	-0.162	---	-0.058	---	-0.012	-0.032	-0.096	-0.096	-0.054	0.054	
30.17	-0.025	-0.078	-0.081	-0.244	-0.081	0.140	-0.018	-0.046	-0.158	---	-0.058	---	-0.010	-0.028	-0.094	-0.094	-0.052	0.056	
31.17	-0.026	-0.102	-0.241	-0.094	---	---	-0.013	-0.068	-0.155	---	-0.054	---	-0.007	-0.028	-0.093	-0.093	-0.052	0.056	
32.17	-0.043	-0.077	-0.101	-0.241	-0.095	0.138	-0.019	-0.044	-0.060	-0.149	-0.060	0.060	-0.012	-0.029	-0.095	-0.095	-0.026	0.056	
33.17	-0.045	---	---	---	---	---	-0.019	---	---	---	-0.061	---	-0.010	---	---	-0.061	---	---	
34.17	-0.047	-0.073	-0.096	-0.239	-0.092	0.146	-0.018	-0.056	-0.060	-0.145	-0.061	0.082	-0.007	-0.027	-0.095	-0.091	-0.026	0.058	
35.17	-0.055	---	---	---	---	---	-0.018	---	---	---	-0.052	---	-0.007	---	---	-0.052	---	---	
36.17	-0.050	-0.072	-0.095	-0.239	-0.092	0.138	-0.015	-0.057	-0.056	-0.141	-0.052	0.066	-0.005	-0.028	-0.097	-0.095	-0.024	0.061	
37.17	-0.057	---	---	---	---	---	-0.016	---	---	---	-0.057	---	-0.007	---	---	-0.057	---	---	
38.15	-0.075	-0.077	-0.097	-0.243	-0.107	0.106	-0.050	-0.040	-0.097	-0.147	-0.069	0.058	-0.010	-0.034	-0.063	-0.104	-0.057	0.058	
38.40	-0.054	---	---	---	---	---	-0.056	---	---	---	-0.056	---	-0.011	---	---	-0.056	---	---	
38.65	-0.093	---	---	---	---	---	-0.046	---	---	---	-0.025	---	-0.025	---	---	-0.046	---	---	
38.90	-0.118	---	---	---	---	---	-0.069	---	---	---	-0.041	---	-0.041	---	---	-0.069	---	---	
39.15	-0.181	-0.123	-0.128	-0.268	-0.210	-0.014	-0.131	-0.083	-0.086	-0.187	-0.160	-0.056	-0.102	-0.072	-0.101	-0.162	-0.138	-0.072	
x, in.	$\alpha = 8^\circ$						$\alpha = 4^\circ$						$\alpha = 0^\circ$						
	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 180^\circ$	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 180^\circ$	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 180^\circ$	
	$\alpha = 8^\circ$						$\alpha = 4^\circ$						$\alpha = 0^\circ$						
0.50	0.075						0.115						0.175						
1.50	0.011						0.040						0.087						
2.50	-0.004	-0.025	-0.014	0.054	0.105	0.176	0.021	0.025	0.042	0.059	0.091	0.114	0.049						
3.50	-0.010						0.007						0.033						
4.50	-0.023	-0.041	-0.049	-0.012	0.022		-0.012	-0.011	-0.005	0.014	0.041	0.065	0.015						
5.50	-0.029						-0.022						-0.001						
6.50	-0.039	-0.058	-0.067	-0.043	0.013	0.076	-0.056	-0.056	-0.089	-0.013	0.004	0.051	-0.016						
8.50	-0.034	-0.057	-0.073	-0.052	-0.005	0.056	-0.059	-0.045	-0.059	-0.024	-0.006	0.012	-0.016						
10.50	-0.053	-0.058	-0.075	-0.062	-0.013	0.044	-0.059	-0.046	-0.045	-0.050	-0.012	0.005	-0.027						
12.50	-0.026	-0.045	-0.072	-0.068	-0.019	0.054	-0.059	-0.042	-0.041	-0.052	-0.018	-0.005	-0.029						
14.50	-0.024	-0.047	-0.074	-0.070	-0.028	0.060	-0.058	-0.045	-0.047	-0.040	-0.028	-0.017	-0.034						
16.50	-0.014	-0.057	-0.081	-0.068	-0.029	0.022	-0.051	-0.059	-0.041	-0.058	-0.026	-0.007	-0.028						
17.17	-0.010						-0.051						-0.029						
18.17	-0.005	-0.066	-0.097	-0.062	-0.027	0.019	-0.026	-0.052	-0.037	-0.054	-0.022	-0.010	-0.025						
19.17	-0.005						-0.014						-0.016						
20.17	-0.001	-0.014	-0.045	-0.055	-0.022	0.027	-0.015	-0.020	-0.026	-0.027	-0.016	-0.001	-0.016						
21.17	-0.010						-0.011				-0.008		-0.014						
22.17	0.014	-0.009	-0.058	-0.040	-0.009	0.058	-0.007	-0.014	-0.019	-0.015	-0.006	0.006	-0.007						
23.17	0.018						-0.004				-0.004		0.004						
24.17	0.021	-0.003	-0.056	-0.003	-0.003	0.059	-0.003	-0.007	-0.018	-0.011	-0.003	0.010	-0.003						
25.17	0.019		-0.026	-0.037	-0.003		-0.003			-0.011	-0.001		-0.003						
26.17	---	-0.001	-0.050	---	0.059	---	-0.005	---	-0.006	---	---	0.010	-0.001						
27.17	-0.023		-0.039	---	0.04	---	-0.011	---	-0.015	---	-0.001	---	-0.001						
28.17	-0.024	-0.001	-0.034	---	0.045	---	-0.001	-0.004	---	-0.008	---	0.012	-0.001						
29.17	-0.024		-0.033	---	0.053	---	-0.001			-0.009	---	0.009	-0.001						
30.17	-0.024	0.004	-0.050	0.006	0.044	0.000	-0.002			-0.008	0.002	0.014	0.001						
31.17	-0.026		-0.029	0.006	0.045	0.001				-0.006	0.005	0.014	0.001						
32.17	-0.023	0.004	-0.026	0.004	0.045	-0.001	-0.003			-0.006	0.004	0.011	0.001						
33.17	0.024		---	---	---	---	0.001			---	---	---	0.000						
34.17	-0.027	0.008	-0.022	-0.024	0.005	0.047	0.001	-0.001	-0.005	-0.005	0.004	0.014	0.002						
35.17	-0.027		---	---	---	---	0.000			---	---	---	-0.001						
36.17	0.024	-0.009	-0.005	-0.024	0.007	0.050	-0.003	-0.007	-0.008	-0.005	0.004	0.014	0.001						
37.17	0.028		---	---	---	---	0.000			---	---	---	-0.004						
38.15	-0.022	-0.003	-0.009	-0.052	-0.001	0.028	-0.												

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NACA RM L53L28a

TABLE I.- Continued
PRESSURE DATA, CYLINDRICAL BODY(b) $M = 0.80$

x, in.	Pressure coefficients of row -														
	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 160^\circ$	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 160^\circ$	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$
	$\alpha = 20^\circ$					$\alpha = 16^\circ$					$\alpha = 12^\circ$				
0.50	-0.002						0.024						0.053		
1.50	-0.058						-0.020						-0.011		
2.50	-0.055	-0.258	-0.298	-0.205	0.101	0.394	-0.055	-0.127	-0.175	-0.084	0.126	0.521	-0.021	-0.075	-0.069
3.50	-0.056	-0.157	-0.359	-0.262	0.024		-0.044						-0.026		
4.50	-0.069	-0.157	-0.359	-0.262	0.024		-0.056	-0.128	-0.212	-0.156	0.054		-0.042	-0.087	-0.116
5.50	-0.071						-0.057						-0.048		
6.50	-0.079	-0.156	-0.343	-0.291	-0.055	0.252	-0.066	-0.152	-0.251	-0.181	-0.005	0.186	-0.059	-0.105	-0.145
8.50	-0.077	-0.149	-0.330	-0.305	-0.065	0.212	-0.049	-0.120	-0.250	-0.198	-0.055	0.151	-0.048	-0.100	-0.148
10.50	-0.045	-0.148	-0.306	-0.312	-0.085	0.188	-0.042	-0.113	-0.223	-0.209	-0.055	0.127	-0.042	-0.093	-0.150
12.50	-0.047	-0.139	-0.287	-0.315	-0.094	0.166	-0.048	-0.099	-0.205	-0.210	-0.066	0.112	-0.055	-0.080	-0.145
14.50	-0.060	-0.135	-0.258	-0.317	-0.109	0.135	-0.045	-0.098	-0.191	-0.218	-0.085	0.081	-0.051	-0.076	-0.145
16.50	-0.066	-0.124	-0.198	-0.308	-0.117	0.134	-0.056	-0.089	-0.165	-0.213	-0.088	0.081	-0.060	-0.066	-0.129
17.17	-0.059						-0.058						-0.060		
18.17	-0.059	-0.111	-0.171	-0.299	-0.120	0.129	-0.059	-0.075	-0.141	-0.207	-0.092	0.074	-0.055	-0.117	-0.128
19.17	-0.046						-0.026						-0.004		
20.17	-0.055	-0.102	-0.144	-0.284	-0.109	0.132	-0.055	-0.113	-0.190	-0.200	-0.060	0.085	-0.042	-0.100	-0.117
21.17	-0.044						-0.028						-0.007		
22.17	-0.056	-0.097	-0.142	-0.265	-0.096	0.137	-0.025	-0.062	-0.110	-0.171	-0.070	0.089	-0.004	-0.058	-0.095
23.17	-0.031						-0.022						-0.004		
24.17	-0.025	-0.090					-0.020	-0.055	-0.161	-0.209	-0.092	0.092	-0.002	-0.054	-0.087
25.17	-0.027						-0.024						-0.006		
26.17		-0.090						-0.052						-0.050	
27.17	-0.022		-0.110	-0.249	-0.076	0.136	-0.016	-0.062	-0.157	-0.201	-0.089	0.089	-0.005		
28.17	-0.024	-0.089	-0.096	-0.245		0.137	-0.020	-0.047	-0.064	-0.157	-0.091	0.091	-0.008	-0.089	-0.092
29.17	-0.029						-0.019						-0.011		
30.17	-0.039	-0.086					-0.018	-0.045	-0.149	-0.205	-0.094	0.094	-0.006	-0.086	-0.091
31.17	-0.028		-0.094	-0.256	-0.079	0.138	-0.014	-0.054	-0.145	-0.204	-0.095	0.095	-0.006	-0.088	-0.091
32.17	-0.034	-0.081	-0.095	-0.237	-0.089	0.138	-0.018	-0.041	-0.049	-0.145	-0.094	0.094	-0.011	-0.085	-0.089
33.17	-0.035						-0.016						-0.008		
34.17	-0.035	-0.077	-0.091	-0.256	-0.094	0.139	-0.015	-0.036	-0.045	-0.140	-0.094	0.095	-0.005	-0.085	-0.089
35.17	-0.041						-0.016						-0.005		
36.17	-0.044	-0.077	-0.092	-0.256	-0.086	0.145	-0.016	-0.037	-0.045	-0.141	-0.094	0.097	-0.002	-0.087	-0.090
37.17	-0.049						-0.021						-0.005		
38.15	-0.057	-0.084	-0.095	-0.245	-0.104	0.115	-0.025	-0.042	-0.051	-0.146	-0.089	0.071	-0.007	-0.085	-0.089
38.40	-0.063						-0.029						-0.012		
38.69	-0.075						-0.041						-0.020		
38.90	-0.100						-0.061						-0.039		
39.15	-0.175	-0.155	-0.127	-0.268	-0.217	-0.027	-0.130	-0.090	-0.088	-0.191	-0.171	-0.067	-0.104	-0.080	-0.104
x, in.	$\alpha = 8^\circ$					$\alpha = 4^\circ$					$\alpha = 0^\circ$				
	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$
	$\alpha = 8^\circ$					$\alpha = 4^\circ$					$\alpha = 0^\circ$				
0.50	0.094					0.142					0.198				
1.50	0.018					0.056					0.104				
2.50	-0.005	-0.018	-0.010	0.059	0.116	0.124	0.027	0.056	0.055	0.068	0.099	0.125	0.062	0.062	0.062
3.50	-0.010						0.015				0.015				
4.50	-0.028	-0.059	-0.044	-0.010	0.055		-0.005	-0.002	0.005	0.020	0.044	0.068	0.021	0.021	0.021
5.50	-0.036						-0.019				0.019				
6.50	-0.050	-0.065	-0.075	-0.040	0.010	0.075	-0.035	-0.054	-0.027	-0.010	0.009	0.051	-0.012	0.005	0.005
8.50	-0.046	-0.066	-0.085	-0.058	-0.005	0.095	-0.056	-0.041	-0.059	-0.027	-0.008	0.009	-0.016	0.002	0.002
10.50	-0.045	-0.069	-0.085	-0.068	-0.018	0.098	-0.040	-0.046	-0.045	-0.025	-0.018	0.002	-0.026	0.002	0.002
12.50	-0.037	-0.059	-0.079	-0.071	-0.024	0.090	-0.038	-0.041	-0.042	-0.026	-0.022	-0.004	-0.026	0.002	0.002
14.50	-0.035	-0.055	-0.085	-0.080	-0.036	0.089	-0.041	-0.046	-0.048	-0.046	-0.031	-0.021	-0.035	0.002	0.002
16.50	-0.024	-0.045	-0.072	-0.075	-0.056	0.012	-0.050	-0.059	-0.042	-0.042	-0.029	-0.015	-0.021	0.002	0.002
17.17	-0.022						-0.050						-0.028		
18.17	-0.016	-0.055	-0.069	-0.071	-0.054	0.011	-0.026	-0.050	-0.055	-0.058	-0.028	-0.015	-0.027		
19.17	-0.002						-0.015						-0.015		
20.17	-0.004	-0.019	-0.050	-0.058	-0.025	0.024	-0.014	-0.018	-0.025	-0.028	-0.020	-0.002	-0.005	0.002	0.002
21.17	0.003						-0.009				-0.012		-0.002		
22.17	0.008	-0.015	-0.041	-0.044	-0.014	0.034	-0.005	-0.013	-0.018	-0.015	-0.010	0.008	-0.005	0.002	0.002
23.17	0.012						0.000				-0.005		0.001		
24.17	0.014	-0.007	-0.038	-0.045	-0.011	0.036	0.001	-0.006	-0.014	-0.010	-0.004	0.010	0.000	0.000	0.000
25.17	0.015						0.001				-0.009	-0.001	0.001	0.001	0.001
26.17		-0.005						-0.005					0.008		
27.17	0.018						0.001				-0.008		0.008		
28.17	0.019	-0.005					0.005	-0.004			-0.012	0.002	0.002	0.002	0.002
29.17	0.016						0.001				-0.011		0.011		
30.17	0.018	0.000					0.004	-0.001			-0.009	0.001	0.014	0.005	0.005
31.17	0.019						0.005				-0.008	0.002	0.014	0.005	0.005
32.17	0.015	-0.002					0.001	-0.001			-0.007	0.002	0.012	0.004	0.004
33.17	0.017						0.005						0.004		
34.17	0.020	0.004	-0.007	-0.026	-0.005	0.045	0.004	0.000	-0.005	-0.006	0.000	0.015	0.005	0.005	0.005
35.17	0.022						0.004				0.000		0.015	0.005	0.005
36.17	0.024	0.005	-0.009	-0.026	-0.006	0.052	0.004	-0.005	-0.007	-0.008	0.000	0.015	0.005	0.005	0.005
37.17	0.020						-0.001						0.000		
38.15	0.016	-0.002	-0.016	-0.056	-0.006	0.028	-0.007	-0.015	-0.019	-0.025	-0.014	-0.007	-0.008		
38.40	0.013						-0.011						-0.014		
38.69	0.006						-0.020						-0.024		
38.90	-0.009						-0.028						-0.040		
39.15	-0.067	-0.059	-0.060	-0.108	-0.108	-0.086	-0.051	-0.074	-0.099	-0.105	-0.105	-0.068			

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TABLE L - Continued
PRESSURE DATA, CYLINDRICAL BODY

(c) $M = 0.85$

Pressure coefficients of row -																		
x, in.	$\alpha = 20^\circ$						$\alpha = 15^\circ$						$\alpha = 12^\circ$					
	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 180^\circ$	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 180^\circ$	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 180^\circ$
0.50	0.005	-----	-----	-----	-----	-----	0.055	-----	-----	-----	-----	-----	0.062	-----	-----	-----	-----	-----
1.50	-0.041	-----	-----	-----	-----	-----	-0.014	-----	-----	-----	-----	-----	-0.006	-----	-----	-----	-----	-----
2.50	-0.054	-0.229	-0.295	-0.199	0.109	0.402	-0.052	-0.125	-0.171	-0.079	0.133	0.328	-0.017	-0.071	-0.034	-0.010	0.128	0.252
3.50	-0.060	-----	-----	-----	-----	-----	-0.041	-----	-----	-----	-----	-----	-0.025	-----	-----	-----	-----	-----
4.50	-0.074	-0.158	-0.341	-0.260	0.027	-----	-0.054	-0.128	-0.212	-0.132	0.077	-----	-0.042	-0.068	-0.116	-0.052	0.065	-----
5.50	-0.078	-----	-----	-----	-----	-----	-0.058	-----	-----	-----	-----	-----	-0.050	-----	-----	-----	-----	-----
6.50	-0.089	-0.160	-0.349	-0.292	-0.051	0.292	-0.067	-0.133	-0.254	-0.180	0.000	0.188	-0.061	-0.108	-0.147	-0.097	0.016	0.184
8.50	-0.066	-0.156	-0.337	-0.311	-0.062	0.213	-0.050	-0.125	-0.233	-0.199	-0.035	0.150	-0.049	-0.103	-0.135	-0.117	-0.013	0.096
10.50	-0.054	-0.155	-0.309	-0.317	-0.064	0.186	-0.045	-0.115	-0.226	-0.209	-0.033	0.125	-0.045	-0.096	-0.137	-0.129	-0.029	0.075
12.50	-0.054	-0.145	-0.268	-0.318	-0.068	0.166	-0.059	-0.105	-0.208	-0.212	-0.068	0.110	-0.054	-0.082	-0.147	-0.132	-0.040	0.061
14.50	-0.069	-0.141	-0.255	-0.324	-0.113	0.132	-0.044	-0.102	-0.195	-0.222	-0.086	0.078	-0.052	-0.080	-0.148	-0.142	-0.055	0.056
16.50	-0.067	-0.128	-0.196	-0.312	-0.119	0.129	-0.059	-0.091	-0.165	-0.217	-0.090	0.079	-0.022	-0.069	-0.132	-0.138	-0.055	0.057
17.17	-0.071	-----	-----	-----	-----	-----	-0.041	-----	-----	-----	-----	-----	-0.025	-----	-----	-----	-----	-----
18.17	-0.070	-0.116	-0.169	-0.305	-0.124	0.121	-0.042	-0.079	-0.144	-0.209	-0.094	0.072	-0.021	-0.058	-0.120	-0.135	-0.061	0.052
19.17	-0.055	-----	-----	-----	-----	-----	-0.026	-----	-----	-----	-----	-----	-0.006	-----	-----	-----	-----	-----
20.17	-0.065	-0.107	-0.141	-0.286	-0.110	0.130	-0.058	-0.066	-0.113	-0.191	-0.085	0.085	-0.014	-0.043	-0.099	-0.122	-0.048	0.044
21.17	-0.051	-----	-0.131	-0.271	-0.102	-----	-0.050	-----	-0.122	-0.179	-0.072	-----	-0.006	-----	-0.108	-0.115	-0.040	-----
22.17	-0.044	-0.101	-0.139	-0.266	-0.100	0.136	-0.026	-0.060	-0.110	-0.170	-0.069	0.091	-0.005	-0.040	-0.094	-0.104	-0.037	0.052
23.17	-0.059	-----	-0.128	-0.259	-0.097	-----	-0.024	-----	-0.094	-0.168	-0.066	-----	-0.004	-----	-0.087	-0.100	-0.055	-----
24.17	-0.052	-0.095	-----	-0.254	-0.087	0.137	-0.019	-0.054	-----	-0.164	-0.059	0.091	-0.004	-0.053	-----	-0.098	-0.028	0.052
25.17	-0.053	-----	-----	-0.254	-0.090	-----	-0.022	-----	-----	-0.163	-0.060	-----	-0.007	-----	-0.073	-0.099	-0.050	-----
26.17	-----	-0.091	-----	-0.245	-----	0.137	-----	-0.052	-----	-0.154	-----	0.090	-----	-0.053	-----	-0.092	-----	0.055
27.17	-0.028	-----	-0.111	-0.250	-0.082	-----	-0.017	-----	-0.085	-0.155	-0.051	-----	-0.007	-----	-----	-0.095	-0.023	-----
28.17	-0.029	-0.091	-0.099	-0.249	-----	0.138	-0.020	-0.048	-0.063	-0.155	-----	0.091	-0.009	-0.052	-----	-0.097	-----	0.052
29.17	-0.035	-----	-----	-0.251	-----	-----	-0.019	-----	-----	-0.157	-----	-----	-0.012	-----	-----	-0.098	-----	-----
30.17	-0.053	-0.066	-----	-0.243	-0.065	0.142	-0.017	-0.044	-----	-0.152	-0.054	0.095	-0.008	-0.029	-----	-0.094	-0.028	0.057
31.17	-0.051	-----	-0.095	-0.239	-0.082	-----	-0.013	-----	-0.056	-0.147	-0.048	-----	-0.006	-----	-----	-0.092	-0.024	-----
32.17	-0.059	-0.086	-0.095	-0.241	-0.092	0.140	-0.018	-0.042	-0.050	-0.146	-0.055	0.095	-0.011	-0.028	-----	-0.092	-0.027	0.057
33.17	-0.039	-----	-----	-----	-----	-----	-0.017	-----	-----	-----	-----	-----	-0.009	-----	-----	-----	-----	-----
34.17	-0.040	-0.082	-0.095	-0.238	-0.095	0.140	-0.013	-0.058	-0.047	-0.142	-0.056	0.092	-0.006	-0.027	-0.051	-0.092	-0.052	0.056
35.17	-0.042	-----	-----	-----	-----	-----	-0.015	-----	-----	-----	-----	-----	-0.007	-----	-----	-----	-----	-----
36.17	-0.043	-0.085	-0.092	-0.240	-0.087	0.148	-0.015	-0.059	-0.048	-0.141	-0.048	0.098	-0.005	-0.051	-0.054	-0.092	-0.027	0.061
37.17	-0.051	-----	-----	-----	-----	-----	-0.020	-----	-----	-----	-----	-----	-0.007	-----	-----	-----	-----	-----
38.15	-0.057	-0.090	-0.098	-0.252	-0.107	0.116	-0.024	-0.047	-0.057	-0.150	-0.064	0.068	-0.011	-0.041	-0.063	-0.109	-0.045	0.054
38.40	-0.063	-----	-----	-----	-----	-----	-0.027	-----	-----	-----	-----	-----	-0.013	-----	-----	-----	-----	-----
38.65	-0.073	-----	-----	-----	-----	-----	-0.059	-----	-----	-----	-----	-----	-0.022	-----	-----	-----	-----	-----
38.90	-0.096	-----	-----	-----	-----	-----	-0.059	-----	-----	-----	-----	-----	-0.041	-----	-----	-----	-----	-----
39.15	-0.173	-0.139	-0.131	-0.275	-0.251	-0.055	-0.150	-0.095	-0.092	-0.200	-0.182	-0.077	-0.109	-0.085	-0.108	-0.180	-0.167	-0.106
x, in.	$\alpha = 8^\circ$						$\alpha = 4^\circ$						$\alpha = 0^\circ$					
	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 180^\circ$	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 180^\circ$	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 180^\circ$
0.50	0.105	-----	-----	-----	-----	-----	0.153	-----	-----	-----	-----	-----	0.209	-----	-----	-----	-----	-----
1.50	0.004	-----	-----	-----	-----	-----	0.066	-----	-----	-----	-----	-----	0.112	-----	-----	-----	-----	-----
2.50	0.000	-0.014	-0.006	0.044	0.120	0.187	0.094	0.041	0.056	0.075	0.105	0.130	0.069	-----	-----	-----	-----	-----
3.50	-0.007	-----	-----	-----	-----	-----	0.021	-----	-----	-----	-----	-----	0.047	-----	-----	-----	-----	-----
4.50	-0.025	-0.058	-0.042	-0.009	-----	-----	-0.000	-0.000	-0.005	-0.028	-0.049	-0.073	0.025	-----	-----	-----	-----	-----
5.50	-0.071	-----	-----	-----	-----	-----	-0.015	-----	-----	-----	-----	-----	0.006	-----	-----	-----	-----	-----
6.50	-0.049	-0.066	-0.075	-0.042	0.010	0.072	-0.035	-0.055	-0.027	-0.007	0.015	0.051	-0.010	-----	-----	-----	-----	-----
8.50	-0.047	-0.069	-0.034	-0.061	-0.005	0.053	-0.056	-0.042	-0.059	-0.025	-0.009	0.010	-0.015	-----	-----	-----	-----	-----
10.50	-0.046	-0.068	-0.038	-0.070	-0.020	0.055	-0.041	-0.046	-0.045	-0.035	-0.017	0.001	-0.025	-----	-----	-----	-----	-----
12.50	-0.058	-0.060	-0.032	-0.075	-0.027	0.028	-0.056	-0.042	-0.043	-0.035	-0.021	-0.005	-0.026	-----	-----	-----	-----	-----
14.50	-0.058	-0.059	-0.036	-0.065	-0.041	0.006	-0.041	-0.047	-0.050	-0.045	-0.031	-0.022	-0.055	-----	-----	-----	-----	-----
16.50	-0.024	-0.048	-0.075	-0.075	-0.041	0.009	-0.052	-0.040	-0.045	-0.042	-0.029	-0.015	-0.050	-----	-----	-----	-----	-----
17.17	-0.022	-----	-----	-----	-----	-----	-0.050	-----	-----	-----	-----	-----	-0.028	-----	-----	-----	-----	-----
18.17	-0.018	-0.057	-0.066	-0.076	-0.059	0.009	-0.029	-0.051	-0.056	-0.057	-0.028	-0.015	-0.025	-----	-----	-----	-----	-----
19.17	-0.002	-----	-----	-----	-----	-----	-0.015	-----	-----	-----	-----	-----	-0.014	-----	-----	-----	-----	-----
20.17	-0.006	-0.022	-0.049	-0.060	-0.028	0.025	-0.011	-0.015	-0.025	-0.026	-0.018	-0.001	-0.013	-----	-----	-----	-----	-----
21.17	0.005	-----	-0.056	-0.051	-0.016	-----	-0.008	-----	-0.052	-0.017	-0.009	-----	-0.008	-----	-----	-----	-----	-----
22.17	0.008	-0.015	-0.041	-0.045	-0.013	0.055	0.000	-0.011	-0.016	-0.012	-0.006	0.010	-0.002	-----	-----	-----	-----	-----
23.17	0.013	-----	-0.059	-0.045	-0.011	-----	0.002	-----	-0.013	-0.010	-0.002	0.002	0.002	-----	-----	-----	-----	-----
24.17	0.015	-0.009	-----	-0.041	-0.007	0.054	0.005	-0.006	-0.013	-0.008	-0.002	0.012	0.004	-----	-----	-----	-----	-----
25.17	0.013	-----	-0.050	-0.040	-0.006	-----	0.009	-----	-----	-0.008	-0.001	-----	0.002	-----	-----	-----	-----	-----
26.17	-----	-0.006	-----	-0.055	-----	0.056	-----	-0.005	-----	-0.007	-----	0.011	-----	-----	-----	-----	-----	-----
27.17	0.017	-----	-----	-0.054	0.000	-----	0.004	-----	-0.012	-0.009	0.004	-----	0.005	-----	-----	-----	-----	-----
28.17	0.016	-0.005	-----	-0.053	-----	0.040	0.005	-0.002	-----	-0.006	-----	0.014	0.004	-----	-----	-----	-----	-----
29.17	0.015	-----	-----	-0.056	-----	-----	0.004	-----	-----	-----	-----	-----	0.005	-----	-----	-----	-----	-----
30.17	0.018	-0.001	-----	-0.054	0.000	0.044	0.006	-0.001	-----	-0.006	0.005	0.018	0.006	-----	-----	-----	-----	-----
31.17	0.018	-----	-----	-0.051	0.005	0.005	0.006	-----	-----	-0.004	0.005	0.005	0.005	-----	-----	-----	-----	-----
32.17	0.016	0.000	-----	-0.049	0.002	0.046	0.005	-0.001	-----	-0.004	0.005	0.016	0.004	-----	-----	-----	-----	-----
33.17	0.017	-----	-----	-----	-----	-----	0.006	-----										

TABLE I.- Continued
PRESSURE DATA, CYLINDRICAL BODY

(d) $M = 0.90$

x, in.	Pressure coefficients of row -														
	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 180^\circ$	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 180^\circ$	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$
	$\alpha = 20^\circ$					$\alpha = 16^\circ$					$\alpha = 12^\circ$				
0.50	0.019	-----	-----	-----	-----	-----	0.047	-----	-----	-----	-----	-----	0.076	-----	-----
1.50	-0.034	-----	-----	-----	-----	-----	-0.007	-----	-----	-----	-----	-----	-0.002	-----	-----
2.50	-0.051	-0.218	-0.288	-0.186	0.120	0.407	-0.028	-0.119	-0.165	-0.068	0.141	0.334	-0.013	-0.065	-0.076
3.50	-0.058	-----	-----	-----	-----	-----	-0.039	-----	-----	-----	-----	-----	-0.018	-----	-----
4.50	-0.074	-0.158	-0.340	-0.253	0.056	-----	-0.055	-0.126	-0.210	-0.189	0.061	-----	-0.041	-0.089	-0.113
5.50	-0.081	-----	-----	-----	-----	-----	-0.060	-----	-----	-----	-----	-----	-0.050	-----	-----
6.50	-0.091	-0.164	-0.355	-0.284	-0.050	0.295	-0.070	-0.136	-0.236	-0.182	-0.002	0.187	-0.065	-0.108	-0.147
8.50	-0.069	-0.162	-0.342	-0.316	-0.094	0.214	-0.055	-0.126	-0.239	-0.204	-0.054	0.150	-0.092	-0.106	-0.157
10.50	-0.059	-0.162	-0.314	-0.323	-0.086	0.185	-0.049	-0.120	-0.250	-0.215	-0.059	0.122	-0.048	-0.100	-0.158
12.50	-0.050	-0.155	-0.268	-0.327	-0.105	0.164	-0.042	-0.108	-0.211	-0.219	-0.075	0.106	-0.058	-0.089	-0.149
14.50	-0.074	-0.149	-0.256	-0.329	-0.121	0.127	-0.049	-0.107	-0.198	-0.250	-0.091	0.072	-0.058	-0.089	-0.151
16.50	-0.071	-0.156	-0.195	-0.318	-0.129	0.125	-0.045	-0.096	-0.169	-0.223	-0.097	0.073	-0.027	-0.073	-0.136
17.17	-0.075	-----	-----	-----	-----	-----	-0.045	-----	-----	-----	-----	-----	-0.025	-----	-----
18.17	-0.075	-0.125	-0.169	-0.310	-0.134	0.116	-0.044	-0.085	-0.144	-0.214	-0.100	0.066	-0.022	-0.061	-0.121
19.17	-0.059	-----	-----	-----	-----	-----	-0.028	-----	-----	-----	-----	-----	-0.007	-----	-----
20.17	-0.067	-0.110	-0.136	-0.286	-0.116	0.129	-0.042	-0.068	-0.111	-0.196	-0.085	0.080	-0.016	-0.045	-0.100
21.17	-0.055	-----	-----	-----	-----	-----	-0.054	-----	-----	-----	-----	-----	-0.008	-----	-----
22.17	-0.047	-0.105	-0.134	-0.262	-0.095	0.135	-0.027	-0.062	-0.107	-0.172	-0.075	0.087	-0.005	-0.058	-0.109
23.17	-0.040	-----	-----	-----	-----	-----	-0.026	-----	-----	-----	-----	-----	-0.004	-----	-----
24.17	-0.035	-0.095	-----	-----	-----	0.150	-0.022	-0.056	-0.165	-0.061	0.089	-----	-0.004	-0.055	-0.105
25.17	-0.035	-----	-----	-----	-----	-----	-0.024	-----	-----	-----	-----	-----	-0.007	-----	-----
26.17	-----	-0.095	-----	-----	-----	0.136	-----	-0.055	-----	-----	0.088	-----	-----	-0.055	-----
27.17	-0.028	-----	-0.110	-0.247	-0.082	-----	-0.019	-----	-0.082	-0.158	-0.054	-----	-0.007	-----	-0.090
28.17	-0.050	-0.095	-0.095	-0.242	0.138	-----	-0.021	-0.050	-0.065	-0.159	0.090	-0.009	-0.009	-0.052	-----
29.17	-0.055	-----	-----	-----	-----	-----	-0.021	-----	-----	-0.161	-----	-----	-0.012	-----	-0.098
30.17	-0.050	-0.088	-----	-----	-----	0.142	-0.019	-0.047	-----	-0.155	0.095	-0.007	-0.028	-----	-0.095
31.17	-0.032	-----	-0.097	-0.234	-0.079	-----	-0.015	-----	-0.056	-0.147	0.051	-0.006	-----	-0.089	-0.084
32.17	-0.038	-0.088	-0.095	-0.258	-0.088	0.140	-0.019	-0.046	-0.055	-0.148	0.092	-0.011	-0.029	-----	-0.089
33.17	-0.059	-----	-----	-----	-----	-----	-0.019	-----	-----	-----	-----	-0.009	-----	-----	-----
34.17	-0.054	-0.084	-0.095	-0.240	-0.095	0.138	-0.016	-0.040	-0.049	-0.145	0.092	-0.006	-0.028	-0.050	-0.090
35.17	-0.045	-----	-----	-----	-----	-----	-0.015	-----	-----	-----	-----	-0.007	-----	-----	-----
36.17	-0.045	-0.086	-0.095	-0.242	-0.088	0.146	-0.014	-0.042	-0.050	-0.145	0.092	-0.006	-0.051	-0.054	-0.090
37.17	-0.049	-----	-----	-----	-----	-----	-0.022	-----	-----	-----	-----	-0.010	-----	-----	-----
38.15	-0.055	-0.095	-0.106	-0.255	-0.129	0.116	-0.024	-0.050	-0.060	-0.157	-0.067	-0.023	-0.043	-0.068	-0.110
38.40	-0.058	-----	-----	-----	-----	-----	-0.029	-----	-----	-----	-----	-0.017	-----	-----	-----
38.65	-0.069	-----	-----	-----	-----	-----	-0.038	-----	-----	-----	-----	-0.023	-----	-----	-----
38.90	-0.090	-----	-----	-----	-----	-----	-0.055	-----	-----	-----	-----	-0.040	-----	-----	-----
39.15	-0.162	-0.145	-0.136	-0.286	-0.266	-0.040	-0.126	-0.102	-0.097	-0.215	-0.200	-0.085	-0.111	-0.091	-0.111
x, in.	Pressure coefficients of row -														
	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 180^\circ$	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 180^\circ$	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$
	$\alpha = 8^\circ$					$\alpha = 4^\circ$					$\alpha = 0^\circ$				
0.50	0.115	-----	-----	-----	-----	-----	0.166	-----	-----	-----	-----	-----	0.221	-----	-----
1.50	0.022	-----	-----	-----	-----	-----	0.075	-----	-----	-----	-----	-----	0.120	-----	-----
2.50	0.004	-0.006	0.001	0.050	0.126	0.194	0.040	0.048	0.064	0.079	0.109	0.156	0.075	-----	-----
3.50	-0.004	-----	-----	-----	-----	-----	0.024	-----	-----	-----	-----	-----	0.051	-----	-----
4.50	-0.025	-0.055	-0.059	-0.05	0.062	-----	0.000	0.004	0.010	0.027	0.051	0.076	0.028	-----	-----
5.50	-0.056	-----	-----	-----	-----	-----	-0.016	-----	-----	-----	-----	-----	0.007	-----	-----
6.50	-0.052	-0.068	-0.076	-0.040	0.011	0.072	-0.056	-0.055	-0.028	-0.012	0.012	0.031	-0.012	-----	-----
8.50	-0.050	-0.069	-0.087	-0.059	-0.005	0.092	-0.059	-0.045	-0.040	-0.050	-0.010	0.007	-0.015	-----	-----
10.50	-0.049	-0.071	-0.090	-0.070	-0.024	0.055	-0.044	-0.048	-0.047	-0.058	-0.021	0.002	-0.028	-----	-----
12.50	-0.041	-0.060	-0.084	-0.074	-0.029	0.025	-0.040	-0.043	-0.044	-0.058	-0.024	0.006	-0.028	-----	-----
14.50	-0.045	-0.061	-0.091	-0.087	-0.045	0.005	-0.046	-0.049	-0.054	-0.051	-0.056	-0.026	-0.040	-----	-----
16.50	-0.051	-0.051	-0.079	-0.081	-0.042	0.007	-0.055	-0.041	-0.045	-0.045	-0.055	-0.018	-0.055	-----	-----
17.17	-0.026	-----	-----	-----	-----	-----	-0.053	-----	-----	-----	-----	-----	-0.051	-----	-----
18.17	-0.021	-0.058	-0.069	-0.077	-0.041	0.005	-0.028	-0.052	-0.057	-0.040	-0.050	-0.018	-0.029	-----	-----
19.17	-0.006	-----	-----	-----	-----	-----	-0.016	-----	-----	-----	-----	-----	-0.019	-----	-----
20.17	-0.009	-0.021	-0.051	-0.062	-0.029	0.020	-0.015	-0.015	-0.024	-0.027	-0.019	-0.002	-0.014	-----	-----
21.17	0.000	-----	-0.060	-0.055	-0.019	-----	-0.009	-----	-0.055	-0.015	-0.010	-----	-0.010	-----	-----
22.17	0.006	-0.017	-0.045	-0.046	-0.017	0.050	-0.005	-0.011	-0.014	-0.015	-0.007	0.011	-0.002	-----	-----
23.17	0.010	-----	-0.040	-0.045	-0.015	-----	0.001	-----	-0.015	-0.010	-0.004	-----	0.002	-----	-----
24.17	0.012	-0.012	-----	-0.040	-0.010	0.055	0.002	-0.004	-0.015	-0.009	-0.002	0.015	0.005	-----	-----
25.17	0.011	-----	-0.051	-0.040	-0.006	-----	0.002	-----	-----	-0.008	0.000	-----	0.002	-----	-----
26.17	-----	-0.008	-----	-0.055	-----	0.052	-----	-0.002	-----	-0.006	-----	0.010	-----	-----	-----
27.17	0.015	-----	-----	-0.056	-0.002	-----	0.005	-----	-0.014	-0.006	0.005	0.010	0.005	-----	-----
28.17	0.015	-0.007	-----	-0.057	0.056	-----	0.005	-0.001	-0.007	-0.007	0.005	0.015	0.004	-----	-----
29.17	0.012	-----	-----	-0.058	-----	-----	0.002	-----	-----	-0.008	-----	0.005	0.005	-----	-----
30.17	0.015	-0.004	-----	-0.054	-0.005	0.040	0.005	0.002	-----	-0.007	0.001	0.016	0.007	-----	-----
31.17	0.015	-----	-----	-0.052	0.000	-----	0.005	-----	-----	-0.005	0.004	0.004	0.004	-----	-----
32.17	0.011	-0.002	-----	-0.051	-0.005	0.041	0.002	0.001	-----	-0.004	0.005	0.024	0.005	-----	-----
33.17	0.015	-----	-----	-----	-----	-----	0.005	-----	-0.005	-0.006	-----	-----	0.005	-----	-----
34.17	0.015	0.002	-0.013	-0.089	-0.005	0.041	0.005	0.001	-0.005	-0.006	0.005	0.015	0.006	-----	-----
35.17	0.015	-----	-----	-----	-----	-----	0.005	-----	-----	-----	-----	-----	0.002	-----	-----
36.17	0.017	0.000	-0.014	-0.029	0.002	0.047	0.005	-0.005	-0.007	-0.009	0.005	0.017	0.005	-----	-----
37.17	0.012	-----	-----	-----	-----	-----	-0.001	-----	-----	-----	-----	-----	-0.002	-----	-----
37.17	0.007	-0.010	-0.025	-0.045	-0.012	0.025	-0.010	-0.018	-0.021	-0.026	-0.014	-0.006	-0.015	-----	-----
38.40	0.005	-----	-----	-----	-----	-----	-0.015	-----	-----	-----	-----	-----	-0.021	-----	-----
38.65	-0.002	-----	-----	-----	-----	-----	-0.021	-----	-----	-----	-----	-----	-0.055	-----	-----
38.90	-0.019	-----	-----	-----	-----	-----	-0.035	-----	-----	-----	-----	-----	-0.049	-----	-----
39.15	-0.078	-0.050	-0.076	-0.127	-0.152	-0.109	-0.062	-0.077	-0.082	-0.112	-0.122	-0.119	-0.079	-----	-----

TABLE I.- Continued
PRESSURE DATA, CYLINDRICAL BODY

(a) $M = 0.95$

x, in.	Pressure coefficients of row -																	
	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 180^\circ$	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 180^\circ$	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 180^\circ$
	$\alpha = 20^\circ$						$\alpha = 16^\circ$						$\alpha = 12^\circ$					
0.50	0.041	-----	-----	-----	-----	-----	0.062	-----	-----	-----	-----	-----	0.094	-----	-----	-----	-----	-----
1.50	-0.021	-----	-----	-----	-----	-----	-0.000	-----	-----	-----	-----	-----	-0.013	-----	-----	-----	-----	-----
2.50	-0.040	-0.200	-0.278	-0.170	0.134	0.421	-0.022	-0.107	-0.155	-0.097	0.151	0.542	-0.006	-0.056	-0.066	0.007	0.146	0.266
3.50	-0.052	-----	-----	-----	-----	-----	-0.058	-----	-----	-----	-----	-----	-0.012	-----	-----	-----	-----	-----
4.50	-0.069	-0.155	-0.331	-0.244	0.046	-----	-0.095	-0.123	-0.207	-0.119	0.067	-----	-0.058	-0.081	-0.108	-0.050	0.073	-----
5.50	-0.080	-----	-----	-----	-----	-----	-0.065	-----	-----	-----	-----	-----	-0.052	-----	-----	-----	-----	-----
6.50	-0.097	-0.170	-0.359	-0.294	-0.024	0.297	-0.079	-0.140	-0.240	-0.124	0.000	0.187	-0.068	-0.115	-0.152	-0.096	0.018	0.126
8.50	-0.079	-0.169	-0.350	-0.316	-0.065	0.215	-0.065	-0.134	-0.245	-0.208	-0.057	0.148	-0.059	-0.112	-0.165	-0.121	-0.016	0.093
10.50	-0.066	-0.168	-0.317	-0.341	-0.096	0.180	-0.061	-0.127	-0.258	-0.226	-0.065	0.117	-0.056	-0.106	-0.169	-0.137	-0.057	0.069
12.50	-0.052	-0.160	-0.266	-0.345	-0.108	0.157	-0.055	-0.116	-0.215	-0.226	-0.060	0.098	-0.044	-0.092	-0.154	-0.139	-0.048	0.054
14.50	-0.032	-0.156	-0.238	-0.377	-0.126	0.122	-0.052	-0.117	-0.206	-0.242	-0.102	0.066	-0.046	-0.095	-0.160	-0.157	-0.069	0.025
16.50	-0.012	-0.142	-0.194	-0.342	-0.134	0.119	-0.053	-0.102	-0.175	-0.255	-0.106	0.066	-0.032	-0.080	-0.145	-0.145	-0.069	0.026
17.17	-0.078	-----	-----	-----	-----	-----	-0.075	-----	-----	-----	-----	-----	-0.050	-----	-----	-----	-----	-----
18.17	-0.076	-0.127	-0.166	-0.386	-0.139	0.108	-0.052	-0.088	-0.147	-0.225	-0.106	0.058	-0.027	-0.068	-0.127	-0.143	-0.070	0.025
19.17	-0.061	-----	-----	-----	-----	-----	-0.055	-----	-----	-----	-----	-----	-0.010	-----	-----	-----	-----	-----
20.17	-0.060	-0.113	-0.134	-0.299	-0.119	0.125	-0.055	-0.071	-0.111	-0.201	-0.090	0.075	-0.020	-0.047	-0.101	-0.124	-0.055	0.040
21.17	-0.064	-----	-0.150	-0.269	-0.108	-----	-0.041	-----	-0.122	-0.179	-0.078	0.069	-0.010	-----	-0.112	-0.112	-0.042	-----
22.17	-0.046	-0.107	-0.156	-0.265	-0.104	0.130	-0.055	-0.064	-0.104	-0.169	-0.078	0.069	-0.006	-0.042	-0.092	-0.101	-0.058	0.049
23.17	-0.042	-----	-0.125	-0.263	-0.099	-----	-0.032	-----	-0.091	-0.169	-0.072	0.069	-0.005	-----	-0.089	-0.101	-0.055	-----
24.17	-0.038	-0.098	-----	-0.258	-0.092	0.134	-0.038	-0.077	-----	-0.165	-0.065	0.068	-0.004	-0.056	-----	-0.097	-0.090	0.055
25.17	-0.037	-----	-0.259	-0.096	-----	-----	-0.051	-----	-0.164	-0.066	-----	-----	-0.009	-----	-0.070	-0.098	-0.050	-----
26.17	-----	-0.096	-----	-0.248	-----	0.131	-----	-0.055	-----	-0.158	-----	0.066	-----	-0.054	-----	-0.092	-0.082	0.051
27.17	-0.029	-----	-0.117	-0.258	-0.084	-----	-0.025	-----	-0.085	-0.155	-0.054	0.066	-0.010	-----	-----	-0.089	-0.022	-----
28.17	-0.031	-0.096	-0.105	-0.259	-----	0.133	-0.026	-0.055	-0.067	-0.161	-----	0.069	-0.012	-0.054	-----	-0.095	-0.025	0.055
29.17	-0.035	-----	-0.256	-----	-----	-----	-0.029	-----	-0.161	-----	-----	-----	-0.014	-----	-----	-0.097	-----	-----
30.17	-0.035	-0.091	-----	-0.246	-0.091	0.156	-0.034	-0.050	-----	-0.157	-----	0.090	-0.010	-0.050	-----	-0.095	-0.028	0.056
31.17	-0.031	-----	-0.100	-0.246	-0.084	-----	-0.021	-----	-0.099	-0.151	-0.054	0.068	-0.010	-----	-----	-0.091	-0.026	-----
32.17	-0.038	-0.092	-0.101	-0.246	-0.097	0.134	-0.029	-0.050	-0.057	-0.151	-0.060	0.068	-0.015	-0.052	-----	-0.092	-0.026	0.056
33.17	-0.040	-----	-----	-----	-----	-----	-0.025	-----	-----	-----	-----	-----	-0.013	-----	-----	-----	-----	-----
34.17	-0.038	-0.090	-0.099	-0.246	-0.100	0.137	-0.025	-0.043	-0.055	-0.147	-0.061	0.069	-0.010	-0.051	-0.052	-0.092	-0.031	0.055
35.17	-0.044	-----	-----	-----	-----	-----	-0.017	-----	-----	-----	-----	-----	-0.014	-----	-----	-----	-----	-----
36.17	-0.045	-0.092	-0.102	-0.252	-0.095	0.142	-0.015	-0.047	-0.058	-0.148	-0.055	0.095	-0.011	-0.054	-0.056	-0.094	-0.029	0.065
37.17	-0.051	-----	-----	-----	-----	-----	-0.025	-----	-----	-----	-----	-----	-0.016	-----	-----	-----	-----	-----
38.15	-0.057	-0.104	-0.118	-0.267	-0.112	0.112	-0.027	-0.058	-0.072	-0.165	-0.069	0.069	-0.020	-0.052	-0.075	-0.112	-0.045	0.099
38.40	-0.059	-----	-----	-----	-----	-----	-0.028	-----	-----	-----	-----	-----	-0.022	-----	-----	-----	-----	-----
38.65	-0.064	-----	-----	-----	-----	-----	-0.035	-----	-----	-----	-----	-----	-0.030	-----	-----	-----	-----	-----
38.90	-0.080	-----	-----	-----	-----	-----	-0.048	-----	-----	-----	-----	-----	-0.045	-----	-----	-----	-----	-----
39.15	-0.159	-0.159	-0.146	-0.562	-0.251	-0.089	-0.102	-0.115	-0.114	-0.267	-0.202	-0.065	-0.101	-0.102	-0.130	-0.227	-0.178	-0.092
$\alpha = 8^\circ$						$\alpha = 4^\circ$						$\alpha = 0^\circ$						
0.50	0.131	-----	-----	-----	-----	-----	0.180	-----	-----	-----	-----	-----	0.255	-----	-----	-----	-----	-----
1.50	0.042	-----	-----	-----	-----	-----	0.061	-----	-----	-----	-----	-----	0.151	-----	-----	-----	-----	-----
2.50	0.011	0.000	0.008	0.056	0.135	0.201	0.018	0.055	0.071	0.086	0.117	0.142	0.032	-----	-----	-----	-----	-----
3.50	0.002	-----	-----	-----	-----	-----	0.025	-----	-----	-----	-----	-----	0.037	-----	-----	-----	-----	-----
4.50	-0.021	-0.032	-0.056	-0.001	0.067	-----	0.001	0.006	0.011	0.050	0.055	0.078	0.004	-----	-----	-----	-----	-----
5.50	-0.058	-----	-----	-----	-----	-----	-0.018	-----	-----	-----	-----	-----	0.009	-----	-----	-----	-----	-----
6.50	-0.058	-0.072	-0.079	-0.044	0.010	0.071	-0.041	-0.057	-0.052	-0.014	0.011	0.029	-0.015	-----	-----	-----	-----	-----
8.50	-0.056	-0.077	-0.092	-0.065	-0.010	0.048	-0.045	-0.048	-0.047	-0.055	-0.014	0.006	-0.019	-----	-----	-----	-----	-----
10.50	-0.059	-0.080	-0.098	-0.079	-0.029	0.027	-0.054	-0.057	-0.055	-0.059	-0.026	-0.007	-0.055	-----	-----	-----	-----	-----
12.50	-0.050	-0.069	-0.092	-0.080	-0.034	0.019	-0.047	-0.050	-0.051	-0.044	-0.028	-0.011	-0.054	-----	-----	-----	-----	-----
14.50	-0.035	-0.074	-0.101	-0.096	-0.056	-0.009	-0.056	-0.061	-0.064	-0.059	-0.049	-0.056	-0.047	-----	-----	-----	-----	-----
16.50	-0.039	-0.061	-0.090	-0.090	-0.052	0.002	-0.046	-0.050	-0.055	-0.052	-0.042	-0.026	-0.059	-----	-----	-----	-----	-----
17.17	-0.055	-----	-----	-----	-----	-----	-0.044	-----	-----	-----	-----	-----	-0.058	-----	-----	-----	-----	-----
18.17	-0.029	-0.047	-0.079	-0.069	-0.051	-0.004	-0.058	-0.058	-0.046	-0.047	-0.058	-0.025	-0.054	-----	-----	-----	-----	-----
19.17	-0.011	-----	-----	-----	-----	-----	-0.022	-----	-----	-----	-----	-----	-0.020	-----	-----	-----	-----	-----
20.17	-0.013	-0.028	-0.057	-0.066	-0.054	0.015	-0.018	-0.017	-0.026	-0.029	-0.025	-0.005	-0.018	-----	-----	-----	-----	-----
21.17	-0.005	-----	-0.065	-0.055	-0.025	-----	-0.014	-----	-0.056	-0.021	-0.025	-0.011	-0.013	-----	-----	-----	-----	-----
22.17	-0.005	-0.020	-0.048	-0.048	-0.018	0.027	-0.006	-0.012	-0.016	-0.012	-0.006	0.007	-0.005	-----	-----	-----	-----	-----
23.17	0.007	-----	-0.044	-0.045	-0.016	-----	-0.001	-----	-0.014	-0.012	-0.004	0.000	0.000	-----	-----	-----	-----	-----
24.17	0.009	-0.016	-----	-0.044	-0.012	0.050	-0.001	-0.004	-0.013	-0.011	-0.002	0.011	0.002	-----	-----	-----	-----	-----
25.17	0.007	-----	-0.056	-0.044	-0.011	-----	-0.001	-----	-0.008	-0.008	0.000	0.000	0.002	-----	-----	-----	-----	-----
26.17	-----	-0.015	-----	-0.058	-----	0.050	-----	-0.004	-----	-0.006	-----	0.010	-----	-----	-----	-----	-----	-----
27.17	0.008	-----	-----	-0.057	-0.006	-----	-0.001	-0.017	-----	-0.007	-0.001	0.010	0.001	-----	-----	-----	-----	-----
28.17	0.008	-0.014	-----	-0.040	-----	0.053	-0.001	-0.004	-----	-0.007	-----	0.013	0.002	-----	-----	-----	-----	-----
29.17	0.006	-----	-----	-0.042	-----	-----	-0.001	-----	-----	-0.008	-----	0.014	0.006	-----	-----	-----	-----	-----
30.17	0.011	-0.010	-----	-0.058	-0.008	0.056	-0.002	-0.001	-----	-0.008	-0.001	0.014	0.006	-----	-----	-----	-----	-----
31.17	0.009	-----	-----	-0.059	-0.005	-----	-0.001	-----	-----	-0.005	0.003	0.003	0.002	-----	-----	-----	-----	-----
32.17	0.005	-0.010	-----	-0.054	-0.006	0.056	-0.001	-0.004	-----	-0.006	0.002	0.015	0.001	-----	-----	-----	-----	-----
33.17	0.005	-----	-----	-----	-----	-----	0.000	-----	-----	-----	-----	-----	0.002	-----	-----	-----	-----	-----
34.17	0																	

TABLE I. - Continued
PRESSURE DATA, CYLINDRICAL BODY

(r) $M = 0.98$

x, in.	Pressure coefficients of row -														
	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 160^\circ$	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 160^\circ$	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$
$\alpha = 20^\circ$															
0.50	0.060	-----	-----	-----	-----	-----	0.086	-----	-----	-----	-----	-----	0.111	-----	-----
1.50	-0.009	-----	-----	-----	-----	-----	0.020	-----	-----	-----	-----	-----	0.025	-----	-----
2.50	-0.030	-0.185	-0.265	-0.154	0.150	0.433	-0.005	-0.095	-0.140	-0.059	0.167	0.356	0.005	-0.042	-0.093
3.50	-0.044	-----	-----	-----	-----	-----	-0.025	-----	-----	-----	-----	-----	-0.005	-----	-----
4.50	-0.062	-0.141	-0.319	-0.256	0.098	-----	-0.043	-0.117	-0.197	-0.111	0.079	-----	-0.032	-0.072	-0.098
5.50	-0.078	-----	-----	-----	-----	-----	-0.053	-----	-----	-----	-----	-----	-0.046	-----	-----
6.50	-0.099	-0.169	-0.348	-0.296	-0.017	0.261	-0.075	-0.147	-0.238	-0.177	0.006	0.194	-0.070	-0.115	-0.151
8.50	-0.080	-0.168	-0.355	-0.329	-0.062	0.214	-0.060	-0.133	-0.241	-0.209	-0.057	0.149	-0.065	-0.116	-0.167
10.50	-0.082	-0.184	-0.359	-0.342	-0.095	0.180	-0.074	-0.146	-0.259	-0.244	-0.071	0.112	-0.065	-0.116	-0.178
12.50	-0.060	-0.158	-0.289	-0.364	-0.125	0.149	-0.042	-0.120	-0.226	-0.247	-0.093	0.091	-0.047	-0.095	-0.161
14.50	-0.109	-0.172	-0.280	-0.356	-0.137	0.115	-0.080	-0.158	-0.221	-0.242	-0.106	0.061	-0.065	-0.108	-0.179
16.50	-0.092	-0.162	-0.217	-0.359	-0.139	0.112	-0.077	-0.180	-0.195	-0.262	-0.130	0.049	-0.045	-0.089	-0.152
17.17	-0.092	-----	-----	-----	-----	-----	-0.047	-----	-----	-----	-----	-----	-0.059	-----	-----
18.17	-0.079	-0.125	-0.165	-0.348	-0.165	0.091	-0.048	-0.090	-0.130	-0.226	-0.127	0.046	-0.051	-0.071	-0.132
19.17	-0.060	-----	-----	-----	-----	-----	-0.026	-----	-----	-----	-----	-----	-0.008	-----	-----
20.17	-0.064	-0.121	-0.142	-0.288	-0.112	0.124	-0.061	-0.072	-0.098	-0.200	-0.105	0.072	-0.021	-0.047	-0.100
21.17	-0.056	-----	-----	-----	-----	-----	-0.040	-----	-----	-----	-----	-----	-0.009	-----	-----
22.17	-0.038	-0.107	-0.132	-0.245	-0.108	0.129	-0.026	-0.069	-0.094	-0.165	-0.075	0.084	-0.004	-0.040	-0.087
23.17	-0.041	-----	-----	-----	-----	-----	-0.027	-----	-----	-----	-----	-----	-0.005	-----	-----
24.17	-0.046	-0.098	-----	-----	-----	0.136	-0.022	-0.056	-----	-----	-----	0.090	-0.004	-0.055	-0.081
25.17	-0.048	-----	-----	-----	-----	0.090	-0.024	-----	-----	-----	-----	0.062	-0.007	-0.067	-0.097
26.17	-----	-0.097	-0.250	-----	0.132	-----	-----	-0.054	-----	-0.161	-----	0.087	-----	-0.055	-----
27.17	-0.059	-0.117	-0.265	-0.085	-----	-----	-0.018	-----	-0.084	-0.152	-0.055	-----	-0.011	-----	-0.085
28.17	-0.054	-0.097	-0.106	-0.262	0.134	-----	-0.022	-0.054	-0.064	-0.170	-----	0.088	-0.012	-0.054	-0.097
29.17	-0.040	-----	-----	-----	-----	-----	-0.024	-----	-----	-0.169	-----	-----	-0.015	-----	-----
30.17	-0.059	-0.094	-----	-----	0.137	-----	-0.019	-0.049	-----	-0.159	-0.057	0.090	-0.010	-0.051	-----
31.17	-0.052	-----	-0.105	-0.248	-0.086	-----	-0.011	-----	-0.098	-0.155	-0.055	-----	-0.011	-----	-0.095
32.17	-0.056	-0.095	-0.104	-0.251	-0.094	0.135	-0.018	-0.051	-0.097	-0.151	-0.060	0.089	-0.017	-0.052	-0.094
33.17	-0.057	-----	-----	-----	-----	-----	-0.022	-----	-----	-----	-----	-----	-0.015	-----	-----
34.17	-0.059	-0.095	-0.102	-0.246	-0.100	0.135	-0.017	-0.045	-0.054	-0.148	-0.059	0.085	-0.013	-0.052	-0.050
35.17	-0.051	-----	-----	-----	-----	-----	-0.025	-----	-----	-----	-----	-----	-0.016	-----	-----
36.17	-0.052	-0.096	-0.106	-0.255	-0.092	0.142	-0.020	-0.050	-0.057	-0.150	-0.055	0.097	-0.013	-0.056	-0.057
37.17	-0.059	-----	-----	-----	-----	-----	-0.025	-----	-----	-----	-----	-----	-0.020	-----	-----
38.15	-0.066	-0.114	-0.125	-0.267	-0.111	0.117	-0.041	-0.067	-0.075	-0.161	-0.064	0.074	-0.031	-0.057	-0.075
38.40	-0.067	-----	-----	-----	-----	-----	-0.041	-----	-----	-----	-----	-----	-0.034	-----	-----
38.65	-0.074	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-0.042	-----	-----
38.90	-0.069	-----	-----	-----	-----	-----	-0.057	-----	-----	-----	-----	-----	-0.052	-----	-----
39.15	-0.126	-0.181	-0.190	-0.372	-0.232	-0.005	-0.095	-0.140	-0.155	-0.274	-0.177	-0.055	-0.097	-0.126	-0.169
$\alpha = 8^\circ$															
0.50	0.149	-----	-----	-----	-----	-----	0.199	-----	-----	-----	-----	-----	0.255	-----	-----
1.50	0.054	-----	-----	-----	-----	-----	0.099	-----	-----	-----	-----	-----	0.145	-----	-----
2.50	0.020	0.012	0.021	0.069	0.144	0.210	0.062	0.065	0.081	0.096	0.126	0.155	0.034	-----	-----
3.50	0.010	-----	-----	-----	-----	-----	0.059	-----	-----	-----	-----	-----	0.065	-----	-----
4.50	-0.014	-0.022	-0.027	0.007	0.073	-----	0.012	0.014	0.018	0.057	0.062	0.087	0.042	-----	-----
5.50	-0.033	-----	-----	-----	-----	-----	-0.009	-----	-----	-----	-----	-----	-0.014	-----	-----
6.50	-0.059	-0.072	-0.076	-0.058	0.010	0.075	-0.057	-0.056	-0.050	-0.015	0.011	0.051	-0.011	-----	-----
8.50	-0.060	-0.078	-0.094	-0.070	-0.009	0.048	-0.045	-0.049	-0.048	-0.053	-0.015	0.011	-0.020	-----	-----
10.50	-0.065	-0.084	-0.105	-0.090	-0.057	0.021	-0.052	-0.060	-0.059	-0.048	-0.055	-0.014	-0.037	-----	-----
12.50	-0.052	-0.069	-0.091	-0.087	-0.045	0.012	-0.045	-0.049	-0.051	-0.043	-0.052	-0.015	-0.055	-----	-----
14.50	-0.069	-0.087	-0.117	-0.115	-0.071	-0.022	-0.067	-0.075	-0.079	-0.076	-0.062	-0.052	-0.055	-----	-----
16.50	-0.049	-0.070	-0.097	-0.102	-0.065	-----	-0.013	-0.049	-----	-0.060	-0.048	-----	-0.054	-0.047	-----
17.17	-0.045	-----	-----	-----	-----	-----	-0.046	-----	-----	-----	-----	-----	-0.047	-----	-----
18.17	-0.055	-0.052	-0.085	-0.096	-0.062	-0.014	-0.057	-0.044	-0.051	-0.055	-0.044	-0.052	-0.040	-----	-----
19.17	-0.015	-----	-----	-----	-----	-----	-0.018	-----	-----	-----	-----	-----	-0.020	-----	-----
20.17	-0.015	-0.026	-0.056	-0.070	-0.057	0.014	-0.016	-0.018	-0.028	-0.050	-0.026	-0.006	-0.018	-----	-----
21.17	-0.002	-----	-----	-----	-----	-----	-0.008	-----	-----	-----	-----	-----	-0.012	-----	-----
22.17	0.005	-0.020	-0.044	-0.050	-0.024	0.026	0.000	-0.011	-0.016	-0.015	-0.010	0.008	-0.002	-----	-----
23.17	0.007	-----	-0.042	-0.048	-0.018	-----	0.002	-----	-0.013	-0.009	-0.004	-----	0.002	-----	-----
24.17	0.009	-0.016	-----	-0.047	-0.015	0.029	0.004	-0.004	-0.012	-0.008	-0.002	0.011	0.002	-----	-----
25.17	0.008	-----	-0.054	-0.046	-0.014	-----	0.004	-----	-----	-0.008	-0.002	-----	0.005	-----	-----
26.17	-----	-0.014	-----	-0.041	-----	0.028	-----	-0.005	-----	-----	-----	0.008	-----	-----	-----
27.17	0.006	-----	-----	-0.058	-0.008	-----	0.004	-----	-0.016	-0.009	0.011	-----	0.005	-----	-----
28.17	0.005	-0.014	-----	-0.045	-----	0.051	0.004	-0.005	-----	-0.010	-----	0.011	0.005	-----	-----
29.15	0.005	-----	-----	-0.045	-----	-----	0.005	-----	-----	-0.011	-----	-----	0.002	-----	-----
30.17	0.008	-0.011	-----	-0.045	-0.012	0.052	0.007	0.001	-----	-0.009	-0.002	0.011	0.007	-----	-----
31.17	0.004	-----	-----	-0.040	-0.009	-----	0.015	-----	-----	-0.007	0.000	-----	0.002	-----	-----
32.17	0.000	-0.015	-----	-0.040	-0.011	0.051	0.002	-0.002	-----	-0.007	0.000	0.011	0.002	-----	-----
33.17	0.001	-----	-----	-----	-----	-----	0.005	-----	-----	-----	-----	-----	0.005	-----	-----
34.17	0.005	-0.012	-0.025	-0.041	-0.012	0.051	0.005	-0.002	-0.006	-0.008	-0.001	0.012	0.004	-----	-----
35.17	0.000	-----	-----	-----	-----	-----	0.001	-----	-----	-----	-----	-----	0.001	-----	-----
36.17	0.000	-0.016	-0.028	-0.043	-0.010	0.057	-0.001	-0.009	-0.012	-0.011	-0.002	0.014	0.000	-----	-----
37.17	-0.008	-----	-----	-----	-----	-----	-0.009	-----	-----	-----	-----	-----	-0.007	-----	-----
38.15	-0.022	-0.057	-0.047	-0.058	-0.021	0.017	-0.024	-0.052	-0.052	-0.029	-0.016	-0.006	-0.024	-----	-----
38.40	-0.025	-----	-----	-----	-----	-----	-0.050	-----	-----	-----	-----	-----	-0.055	-----	-----
38.65	-0.035	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-0.047	-----	-----
38.90	-0.050	-----	-----	-----	-----	-----	-0.056	-----	-----	-----	-----	-----	-0.074	-----	-----
39.15	-0.105	-0.095	-0.140	-0.179	-0.145	-0.095	-0.085	-0.085	-0.125	-0.132	-0.146	-0.132	-0.117	-----	-----

TABLE I.- Continued
PRESSURE DATA, CYLINDRICAL BODY

(g) $M = 1.00$

x, in.	Pressure coefficients of row -																	
	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 180^\circ$	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 180^\circ$	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 180^\circ$
	$\alpha = 20^\circ$						$\alpha = 16^\circ$						$\alpha = 12^\circ$					
0.50	0.078	—	—	—	—	—	0.106	—	—	—	—	—	0.129	—	—	—	—	—
1.50	0.007	—	—	—	—	—	0.071	—	—	—	—	—	0.040	—	—	—	—	—
2.50	-0.018	-0.125	-0.259	-0.138	0.164	0.442	-0.078	-0.127	-0.026	0.180	0.369	0.015	-0.050	-0.041	0.054	0.170	0.289	
3.50	-0.054	—	—	—	—	—	-0.009	—	—	—	—	0.012	—	—	—	—	—	
4.50	-0.066	-0.131	-0.314	-0.219	0.073	—	-0.026	-0.097	-0.174	-0.100	0.093	-0.018	-0.059	-0.068	-0.068	0.093	—	
5.50	-0.067	—	—	—	—	—	-0.047	—	—	—	—	-0.054	—	—	—	—	—	
6.50	-0.091	-0.165	-0.352	-0.279	-0.005	0.270	-0.066	-0.132	-0.227	-0.168	0.015	0.205	-0.065	-0.107	-0.141	-0.080	0.026	0.138
8.50	-0.078	-0.168	-0.353	-0.317	-0.092	0.219	-0.059	-0.131	-0.241	-0.205	-0.050	0.156	-0.056	-0.107	-0.158	-0.119	-0.011	0.097
10.50	-0.082	-0.184	-0.358	-0.350	-0.095	0.185	-0.070	-0.142	-0.255	-0.235	-0.059	0.119	-0.070	-0.117	-0.177	-0.146	-0.043	0.069
12.50	-0.080	-0.181	-0.359	-0.366	-0.117	0.150	-0.066	-0.136	-0.259	-0.251	-0.059	0.071	-0.061	-0.108	-0.173	-0.138	-0.065	0.043
14.50	-0.115	-0.187	-0.285	-0.378	-0.146	0.106	-0.095	-0.149	-0.241	-0.272	-0.123	0.050	-0.075	-0.118	-0.189	-0.182	-0.068	0.007
16.50	-0.112	-0.176	-0.225	-0.372	-0.160	0.099	-0.081	-0.141	-0.212	-0.273	-0.138	0.040	-0.064	-0.115	-0.176	-0.184	-0.097	0.005
17.17	-0.122	—	—	—	—	—	-0.096	—	—	—	—	—	-0.067	—	—	—	—	—
18.17	-0.113	-0.170	-0.205	-0.370	-0.168	0.080	-0.091	-0.136	-0.194	-0.273	-0.152	0.024	-0.065	-0.108	-0.169	-0.189	-0.109	-0.012
19.17	-0.105	—	—	—	—	—	-0.067	—	—	—	—	—	-0.042	—	—	—	—	—
20.17	-0.084	-0.138	-0.164	-0.347	-0.159	0.088	-0.052	-0.111	-0.147	-0.250	-0.158	0.058	-0.057	-0.072	-0.134	-0.165	-0.096	0.000
21.17	-0.087	—	—	—	—	—	-0.070	—	—	—	—	—	-0.057	—	—	—	—	—
22.17	-0.066	-0.078	-0.081	-0.275	-0.138	0.105	-0.025	-0.075	-0.110	-0.199	-0.106	0.054	-0.020	-0.021	-0.059	-0.081	-0.059	0.046
23.17	-0.068	—	—	—	—	—	-0.078	—	—	—	—	—	0.019	—	—	—	—	—
24.17	-0.057	-0.066	-0.066	-0.195	-0.078	0.161	-0.007	-0.054	-0.062	-0.179	-0.092	0.099	-0.016	-0.020	-0.056	-0.074	-0.007	0.077
25.17	-0.085	—	—	—	—	—	-0.001	—	—	—	—	—	-0.007	—	—	—	—	—
26.17	—	-0.086	—	-0.235	—	0.148	—	-0.058	—	-0.128	—	0.115	—	-0.024	—	-0.076	—	0.066
27.17	-0.056	—	-0.105	-0.251	-0.072	—	-0.006	—	-0.061	-0.151	-0.051	—	-0.004	—	—	-0.072	-0.014	0.061
28.17	-0.026	-0.024	-0.096	-0.244	—	0.140	-0.010	-0.047	-0.057	-0.157	—	0.107	-0.008	-0.050	—	-0.100	—	—
29.17	-0.038	—	—	-0.256	—	—	-0.018	—	—	-0.156	—	—	0.012	—	—	-0.096	—	—
30.17	-0.053	-0.079	—	-0.259	-0.087	0.137	-0.016	-0.044	-0.058	-0.151	-0.053	0.097	-0.008	-0.028	—	-0.096	-0.051	0.058
31.17	-0.052	—	-0.087	-0.255	-0.078	—	-0.012	—	-0.062	-0.152	-0.051	—	-0.004	—	—	-0.091	-0.028	—
32.17	-0.044	-0.080	-0.085	-0.232	-0.067	0.136	-0.009	-0.048	-0.062	-0.154	-0.058	0.089	-0.015	-0.052	—	-0.095	-0.052	0.097
33.17	-0.055	—	—	—	—	—	-0.018	—	—	—	—	—	-0.015	—	—	—	—	—
34.17	-0.048	-0.080	-0.086	-0.226	-0.090	0.138	-0.012	-0.047	-0.058	-0.153	-0.065	0.085	-0.008	-0.050	-0.049	-0.091	-0.055	0.057
35.17	-0.053	—	—	—	—	—	-0.018	—	—	—	—	—	-0.014	—	—	—	—	—
36.17	-0.054	-0.082	-0.087	-0.230	-0.080	0.146	-0.016	-0.048	-0.058	-0.150	-0.054	0.095	-0.011	-0.054	-0.054	-0.092	-0.026	0.065
37.17	-0.063	—	—	—	—	—	-0.028	—	—	—	—	—	-0.018	—	—	—	—	—
38.15	-0.077	-0.105	-0.106	-0.240	-0.091	0.126	-0.042	-0.067	-0.070	-0.155	-0.059	0.081	-0.058	-0.057	-0.070	-0.105	-0.055	0.048
38.40	-0.085	—	—	—	—	—	-0.045	—	—	—	—	—	-0.058	—	—	—	—	—
38.65	-0.095	—	—	—	—	—	-0.061	—	—	—	—	—	-0.056	—	—	—	—	—
38.90	-0.109	—	—	—	—	—	-0.082	—	—	—	—	—	-0.076	—	—	—	—	—
39.15	-0.145	-0.214	-0.220	-0.347	-0.201	0.018	-0.119	-0.125	-0.195	-0.260	-0.156	-0.009	-0.119	-0.171	-0.201	-0.214	-0.135	-0.042
	$\alpha = 8^\circ$						$\alpha = 4^\circ$						$\alpha = 0^\circ$					
0.50	0.162	—	—	—	—	—	0.211	—	—	—	—	—	0.226	—	—	—	—	—
1.50	0.068	—	—	—	—	—	0.108	—	—	—	—	—	0.158	—	—	—	—	—
2.50	0.052	0.022	0.053	0.082	0.153	0.221	0.072	0.076	0.090	0.106	0.138	0.164	0.104	—	—	—	—	—
3.50	0.023	—	—	—	—	—	0.046	—	—	—	—	—	0.077	—	—	—	—	—
4.50	-0.002	-0.013	-0.016	0.016	0.085	—	0.020	0.022	0.028	0.046	0.073	0.097	0.053	—	—	—	—	—
5.50	-0.024	—	—	—	—	—	-0.005	—	—	—	—	—	0.025	—	—	—	—	—
6.50	-0.051	-0.065	-0.072	-0.058	0.016	0.078	-0.034	-0.055	-0.027	-0.008	0.018	0.058	-0.006	—	—	—	—	—
8.50	-0.050	-0.071	-0.087	-0.065	-0.005	0.051	-0.058	-0.041	-0.042	-0.027	-0.009	0.009	-0.014	—	—	—	—	—
10.50	-0.071	-0.095	-0.109	-0.092	-0.040	0.018	-0.085	-0.070	-0.068	-0.055	-0.058	-0.018	-0.045	—	—	—	—	—
12.50	-0.067	-0.086	-0.109	-0.102	-0.025	0.001	-0.065	-0.068	-0.069	-0.060	-0.047	-0.029	-0.050	—	—	—	—	—
14.50	-0.079	-0.104	-0.127	-0.125	-0.079	-0.050	-0.080	-0.084	-0.086	-0.082	-0.069	-0.057	-0.069	—	—	—	—	—
16.50	-0.072	-0.094	-0.120	-0.124	-0.062	-0.051	-0.075	-0.080	-0.084	-0.080	-0.070	-0.053	-0.065	—	—	—	—	—
17.17	-0.073	—	—	—	—	—	-0.077	—	—	—	—	—	-0.070	—	—	—	—	—
18.17	-0.066	-0.086	-0.118	-0.127	-0.090	-0.040	-0.075	-0.078	-0.086	-0.085	-0.074	-0.056	-0.068	—	—	—	—	—
19.17	-0.045	—	—	—	—	—	-0.057	—	—	—	—	—	—	—	—	—	—	—
20.17	-0.028	-0.041	-0.078	-0.100	-0.074	-0.025	-0.045	-0.057	-0.062	-0.059	-0.042	-0.021	-0.059	—	—	—	—	—
21.17	0.007	—	-0.062	-0.059	-0.057	—	-0.021	—	-0.055	-0.055	-0.051	—	-0.001	—	—	—	—	—
22.17	0.022	-0.006	-0.026	-0.077	-0.008	0.040	0.014	0.004	-0.001	0.004	0.006	0.022	0.020	—	—	—	—	—
23.17	0.024	—	—	-0.050	0.000	—	0.020	—	0.006	0.013	0.019	0.021	0.021	—	—	—	—	—
24.17	0.024	-0.004	—	-0.051	-0.001	0.045	0.019	0.011	0.005	0.010	0.016	0.051	0.017	—	—	—	—	—
25.17	0.019	—	-0.024	-0.055	-0.005	—	0.016	—	—	0.007	—	—	0.014	—	—	—	—	—
26.17	—	-0.009	—	-0.056	—	0.054	—	0.005	—	—	—	0.020	—	—	—	—	—	—
27.17	0.012	—	—	-0.051	-0.005	—	0.006	—	-0.012	—	—	0.006	—	—	—	—	—	—
28.17	0.008	-0.015	—	-0.045	—	0.050	0.004	-0.005	—	-0.006	—	0.016	0.006	—	—	—	—	—
29.17	0.006	—	—	-0.048	—	—	0.001	—	—	-0.009	—	—	0.005	—	—	—	—	—
30.17	0.009	-0.012	—	-0.044	—	0.051	0.004	-0.002	—	-0.008	-0.001	0.013	0.010	—	—	—	—	—
31.17	0.007	—	—	-0.042	-0.011	—	-0.002	—	—	-0.007	0.000	—	0.002	—	—	—	—	—
32.17	0.002	-0.013	—	-0.042	-0.014	0.029	-0.002	-0.005	—	-0.007	0.000	0.012	0.002	—	—	—	—	—
33.17	0.005	—	—	—	—	—	0.000	—	—	—	—	—	0.004	—	—	—	—	—
34.17	0.005	-0.011	-0.025															

(b) $H = 1.03$

CONFIDENTIAL

TABLE L - Continued
PRESSURE DATA, CYLINDRICAL BODY

(1) $M = 1.06$

x, in.	Pressure coefficients of row -																	
	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 180^\circ$	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 180^\circ$	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 180^\circ$
$\alpha = 20^\circ$						$\alpha = 16^\circ$						$\alpha = 12^\circ$						
0.50	0.112	—	—	—	—	—	0.122	—	—	—	—	—	0.124	—	—	—	—	—
1.50	0.045	—	—	—	—	—	0.045	—	—	—	—	—	0.057	—	—	—	—	—
2.50	0.001	-0.097	-0.228	-0.099	0.205	0.471	0.017	-0.069	-0.104	0.000	0.202	0.354	0.037	-0.004	-0.013	0.062	0.197	0.317
3.50	-0.005	—	—	—	—	—	0.020	—	—	—	—	—	0.049	—	—	—	—	—
4.50	-0.019	-0.105	-0.280	-0.174	0.113	—	0.006	-0.065	-0.144	-0.056	0.125	—	0.026	-0.017	-0.045	0.009	0.128	—
5.50	-0.025	—	—	—	—	—	-0.015	—	—	—	—	—	0.000	—	—	—	—	—
6.50	-0.059	-0.114	-0.305	-0.257	0.059	0.303	-0.055	-0.097	-0.186	-0.124	0.056	0.234	-0.025	-0.062	-0.096	-0.043	0.060	0.169
8.50	-0.058	-0.139	-0.316	-0.269	-0.010	0.253	-0.054	-0.107	-0.225	-0.177	0.001	0.184	-0.051	-0.078	-0.126	-0.084	0.027	0.188
10.50	-0.089	-0.175	-0.326	-0.318	-0.055	0.214	-0.097	-0.114	-0.212	-0.210	-0.048	0.137	-0.052	-0.085	-0.152	-0.117	-0.059	0.092
12.50	-0.071	-0.157	-0.270	-0.354	-0.092	0.172	-0.048	-0.108	-0.202	-0.205	-0.055	0.127	-0.045	-0.087	-0.150	-0.141	-0.047	0.055
14.50	-0.065	-0.156	-0.207	-0.363	-0.114	0.158	-0.054	-0.111	-0.219	-0.248	-0.055	0.089	-0.077	-0.115	-0.178	-0.164	-0.068	0.027
16.50	-0.072	-0.150	-0.170	-0.322	-0.129	0.125	-0.044	-0.102	-0.160	-0.248	-0.111	0.073	-0.032	-0.083	-0.151	-0.165	-0.082	0.016
17.17	-0.072	—	—	—	—	—	-0.052	—	—	—	—	—	-0.057	—	—	—	—	—
18.17	-0.065	-0.139	-0.162	-0.329	-0.130	0.117	-0.051	-0.100	-0.146	-0.229	-0.115	0.047	-0.055	-0.077	-0.132	-0.147	-0.080	0.003
19.17	-0.067	—	—	—	—	—	-0.046	—	—	—	—	—	-0.016	—	—	—	—	—
20.17	-0.072	-0.122	-0.143	-0.308	-0.120	0.125	-0.044	-0.089	-0.119	-0.220	-0.108	0.062	-0.017	-0.055	-0.108	-0.144	-0.075	0.027
21.17	-0.067	—	—	—	—	—	-0.045	—	—	—	—	—	-0.028	—	—	—	—	—
22.17	-0.041	-0.101	-0.128	-0.295	-0.112	0.124	-0.040	-0.085	-0.111	-0.192	-0.094	0.065	-0.007	-0.045	-0.089	-0.105	-0.050	0.057
23.17	-0.039	—	—	—	—	—	-0.038	—	—	—	—	—	-0.039	—	—	—	—	—
24.17	-0.059	-0.094	—	-0.255	-0.096	0.125	-0.055	-0.075	—	-0.176	-0.071	0.076	-0.035	-0.007	-0.051	-0.084	-0.026	0.055
25.17	-0.065	—	—	-0.249	-0.096	—	-0.059	—	—	-0.181	-0.074	—	0.021	—	-0.051	-0.062	-0.022	—
26.17	—	-0.104	—	-0.241	—	0.151	—	0.002	—	-0.156	—	0.089	—	-0.021	—	-0.059	—	0.064
27.17	-0.060	—	-0.110	-0.249	-0.079	—	0.054	—	0.001	-0.062	0.005	—	-0.015	—	—	-0.071	-0.001	—
28.17	-0.056	-0.100	-0.096	-0.242	—	0.155	0.015	-0.012	0.019	-0.087	—	0.165	-0.025	-0.041	—	-0.055	—	0.065
29.17	-0.049	—	—	-0.235	—	—	-0.025	—	—	-0.140	—	—	-0.045	—	—	-0.101	—	—
30.17	-0.010	-0.061	—	-0.205	-0.055	0.174	-0.054	-0.055	—	-0.157	-0.046	0.119	-0.040	-0.056	—	-0.035	-0.050	0.050
31.17	-0.018	—	-0.071	-0.207	-0.017	—	-0.068	—	-0.076	-0.169	-0.059	—	-0.009	—	—	-0.075	-0.001	—
32.17	-0.058	-0.068	-0.078	-0.254	-0.052	0.189	-0.061	-0.076	-0.087	-0.184	-0.085	0.072	-0.015	-0.022	—	-0.074	0.007	0.108
33.17	-0.049	—	—	—	—	—	-0.068	—	—	—	—	—	-0.011	—	—	—	—	—
34.17	-0.058	-0.087	-0.100	-0.258	-0.099	0.145	-0.065	-0.080	-0.094	-0.188	-0.098	0.054	-0.015	-0.052	-0.064	-0.114	-0.045	0.056
35.17	-0.070	—	—	—	—	—	-0.062	—	—	—	—	—	-0.029	—	—	—	—	—
36.17	-0.082	-0.109	-0.114	-0.274	-0.111	0.128	-0.069	-0.088	-0.097	-0.195	-0.095	0.065	-0.052	-0.050	-0.077	-0.126	-0.060	0.058
37.17	-0.092	—	—	—	—	—	-0.071	—	—	—	—	—	-0.045	—	—	—	—	—
38.15	-0.100	-0.126	-0.124	-0.275	-0.126	0.097	-0.075	-0.096	-0.101	-0.196	-0.101	0.042	-0.048	-0.071	-0.086	-0.139	-0.075	0.008
38.40	-0.099	—	—	—	—	—	-0.075	—	—	—	—	—	-0.048	—	—	—	—	—
38.65	-0.105	—	—	—	—	—	-0.079	—	—	—	—	—	-0.052	—	—	—	—	—
38.90	-0.111	—	—	—	—	—	-0.081	—	—	—	—	—	-0.062	—	—	—	—	—
39.15	-0.124	-0.226	-0.252	-0.314	-0.171	0.060	-0.098	-0.204	-0.209	-0.245	-0.145	0.007	-0.088	-0.184	-0.189	-0.185	-0.115	-0.025
$\alpha = 8^\circ$						$\alpha = 4^\circ$						$\alpha = 0^\circ$						
0.50	0.132	—	—	—	—	—	0.206	—	—	—	—	—	0.246	—	—	—	—	—
1.50	0.082	—	—	—	—	—	0.107	—	—	—	—	—	0.159	—	—	—	—	—
2.50	0.048	0.059	0.046	0.095	0.175	0.241	0.032	0.068	0.100	0.114	0.149	0.177	0.111	—	—	—	—	—
3.50	0.051	—	—	—	—	—	0.081	—	—	—	—	—	0.090	—	—	—	—	—
4.50	0.031	0.020	0.012	0.051	0.112	—	0.058	0.056	0.060	0.077	0.099	0.124	0.074	—	—	—	—	—
5.50	0.004	—	—	—	—	—	0.035	—	—	—	—	—	0.051	—	—	—	—	—
6.50	-0.017	-0.050	-0.059	-0.009	0.050	0.108	0.007	0.006	0.013	0.050	0.050	0.067	0.026	—	—	—	—	—
8.50	-0.025	-0.045	-0.059	-0.056	0.018	0.074	-0.009	-0.015	-0.015	0.001	0.016	0.052	0.012	—	—	—	—	—
10.50	-0.040	-0.059	-0.075	-0.057	-0.005	0.047	-0.028	-0.054	-0.054	-0.021	-0.006	0.009	-0.009	—	—	—	—	—
12.50	-0.055	-0.079	-0.106	-0.094	-0.038	0.024	-0.041	-0.050	-0.055	-0.059	-0.018	0.005	-0.018	—	—	—	—	—
14.50	-0.065	-0.080	-0.107	-0.110	-0.071	0.020	-0.054	-0.060	-0.069	-0.072	-0.062	-0.045	-0.062	—	—	—	—	—
16.50	-0.056	-0.075	-0.094	-0.091	-0.047	0.004	-0.066	-0.070	-0.069	-0.065	-0.056	-0.059	-0.069	—	—	—	—	—
17.17	-0.058	—	—	—	—	—	-0.066	—	—	—	—	—	-0.027	—	—	—	—	—
18.17	-0.042	-0.065	-0.107	-0.106	-0.061	0.004	-0.056	-0.064	-0.068	-0.057	-0.056	-0.016	-0.057	—	—	—	—	—
19.17	-0.024	—	—	—	—	—	-0.025	—	—	—	—	—	-0.042	—	—	—	—	—
20.17	-0.026	-0.056	-0.070	-0.091	-0.065	-0.009	-0.021	-0.026	-0.040	-0.050	-0.055	-0.051	-0.045	—	—	—	—	—
21.17	-0.017	—	-0.075	-0.066	-0.047	—	-0.020	—	—	-0.027	-0.051	-0.051	-0.017	—	—	—	—	—
22.17	-0.004	-0.051	-0.059	-0.067	-0.037	0.004	-0.011	-0.020	-0.024	-0.019	-0.011	-0.001	-0.001	—	—	—	—	—
23.17	0.004	—	-0.052	-0.060	-0.037	—	0.001	—	—	-0.015	-0.011	—	—	—	—	—	—	—
24.17	0.008	-0.020	—	-0.056	-0.029	0.014	0.008	-0.002	-0.015	-0.015	-0.009	0.003	0.002	—	—	—	—	—
25.17	0.010	—	-0.055	-0.052	-0.024	—	0.016	—	—	-0.009	-0.005	—	0.003	—	—	—	—	—
26.17	—	-0.007	—	-0.059	—	0.018	—	0.004	—	0.008	—	0.006	—	—	—	—	—	—
27.17	0.035	—	—	-0.025	-0.005	—	0.041	—	0.015	—	0.019	—	0.051	—	—	—	—	—
28.17	0.044	0.019	—	-0.006	—	0.068	0.025	0.016	—	0.017	—	0.056	—	—	—	—	—	—
29.17	0.058	—	—	0.002	—	—	0.010	—	—	0.040	—	0.050	—	—	—	—	—	—
30.17	0.051	0.009	—	-0.006	0.036	0.066	0.019	0.014	—	0.028	0.050	0.051	—	—	—	—	—	—
31.17	0.011	—	—	-0.050	0.009	—	0.006	—	—	0.021	0.006	—	0.017	—	—	—	—	—
32.17	-0.011	-0.025	—	-0.051	-0.018	0.051	0.004	-0.002	—	-0.010	-0.005	0.009	-0.006	—	—	—	—	—
33.17	-0.025	—	—	—	—	—	-0.005	—	—	—	—	—	-0.021	—	—	—	—	—

CONFIDENTIAL

NACA RM L53L28a

TABLE I.- Continued
PRESSURE DATA, CYLINDRICAL BODY

(s) $M = 1.10$

x, in.	Pressure coefficients of row -																	
	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 180^\circ$	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 180^\circ$	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 180^\circ$
	$\alpha = 20^\circ$						$\alpha = 16^\circ$						$\alpha = 12^\circ$					
0.50	0.097	---	---	---	---	---	0.119	---	---	---	---	---	0.117	---	---	---	---	---
1.50	0.058	---	---	---	---	---	0.091	---	---	---	---	---	0.045	---	---	---	---	---
2.50	0.006	-0.092	-0.227	-0.069	0.215	0.476	0.020	-0.068	-0.098	0.001	0.205	0.390	0.010	-0.023	-0.081	0.045	0.175	0.290
3.50	0.008	---	---	---	---	---	0.084	---	---	---	---	---	0.041	---	---	---	---	---
4.50	-0.012	-0.097	-0.261	-0.161	-0.125	---	0.008	-0.062	-0.142	-0.066	-0.125	---	0.025	-0.017	-0.045	0.006	0.125	---
5.50	-0.058	---	---	---	---	---	-0.014	---	---	---	---	---	0.008	---	---	---	---	---
6.50	-0.058	-0.131	-0.310	-0.227	0.051	0.311	-0.051	-0.095	-0.187	-0.127	0.055	0.254	-0.017	-0.057	-0.095	-0.041	0.066	-0.177
8.50	-0.042	-0.131	-0.307	-0.271	0.002	0.260	-0.029	-0.094	-0.201	-0.161	0.011	0.187	-0.025	-0.069	-0.118	-0.079	0.027	0.129
10.50	-0.074	-0.160	-0.307	-0.307	-0.048	0.218	-0.045	-0.119	-0.255	-0.198	-0.022	0.157	-0.048	-0.089	-0.146	-0.112	-0.010	0.096
12.50	-0.090	-0.172	-0.289	-0.352	-0.075	0.181	-0.055	-0.118	-0.217	-0.246	-0.077	0.110	-0.027	-0.078	-0.155	-0.131	-0.028	0.074
14.50	-0.091	-0.167	-0.246	-0.372	-0.117	0.135	-0.089	-0.140	-0.221	-0.245	-0.110	0.062	-0.058	-0.096	-0.158	-0.159	-0.071	0.055
16.50	-0.093	-0.160	-0.189	-0.374	-0.139	0.119	-0.068	-0.122	-0.195	-0.255	-0.097	0.065	-0.069	-0.111	-0.170	-0.168	-0.077	0.021
17.17	-0.090	---	---	---	---	---	-0.068	---	---	---	---	---	-0.054	---	---	---	---	---
18.17	-0.090	-0.155	-0.165	-0.314	-0.155	0.096	-0.056	-0.104	-0.166	-0.256	-0.110	0.066	-0.049	-0.092	-0.165	-0.186	-0.102	0.000
19.17	-0.090	---	---	---	---	---	-0.049	---	---	---	---	---	-0.037	---	---	---	---	---
20.17	-0.071	-0.158	-0.145	-0.315	-0.118	0.112	-0.045	-0.090	-0.125	-0.235	-0.129	0.051	-0.024	-0.070	-0.121	-0.159	-0.105	0.001
21.17	-0.083	-0.145	-0.114	-0.302	-0.114	---	-0.047	---	-0.124	-0.210	-0.114	---	-0.032	---	-0.119	-0.152	-0.082	---
22.17	-0.079	-0.125	-0.118	-0.313	-0.118	0.119	-0.035	-0.085	-0.105	-0.200	-0.094	0.099	-0.022	-0.065	-0.104	-0.140	-0.065	0.015
23.17	-0.067	-0.127	-0.267	-0.246	-0.116	---	-0.035	-0.085	-0.107	-0.177	-0.088	---	-0.014	---	-0.094	-0.115	-0.048	---
24.17	-0.069	-0.110	-0.265	-0.099	-0.125	---	-0.028	-0.069	-0.171	-0.069	0.077	---	-0.016	---	-0.091	-0.111	-0.041	0.046
25.17	-0.044	---	-0.269	-0.087	---	---	-0.038	---	-0.178	-0.076	---	---	-0.016	---	-0.091	-0.111	-0.044	---
26.17	-0.089	-0.080	-0.258	-0.086	0.132	---	-0.040	-0.067	-0.167	---	0.076	---	-0.043	---	-0.101	-0.095	0.040	---
27.17	-0.089	-0.080	-0.258	-0.086	0.132	---	-0.040	-0.067	-0.167	---	0.076	---	-0.043	---	-0.101	-0.095	0.040	---
28.17	-0.087	-0.075	-0.082	-0.256	-0.086	0.127	-0.039	-0.071	-0.085	-0.175	0.080	---	-0.051	---	-0.095	-0.052	---	---
29.17	-0.074	-0.077	-0.256	-0.086	0.127	---	-0.039	-0.071	-0.085	-0.175	0.080	---	-0.051	---	-0.095	-0.052	---	---
30.17	-0.074	-0.077	-0.256	-0.086	0.127	---	-0.039	-0.071	-0.085	-0.175	0.080	---	-0.051	---	-0.095	-0.052	---	---
31.17	-0.047	-0.075	-0.219	-0.097	0.122	---	-0.031	-0.055	-0.181	-0.079	0.074	---	-0.009	-0.005	-0.089	-0.028	0.052	---
32.17	-0.042	-0.067	-0.187	-0.081	---	---	-0.008	-0.045	-0.165	-0.074	0.074	---	-0.013	---	-0.061	-0.027	-0.006	0.055
33.17	-0.052	-0.085	-0.071	-0.177	-0.059	0.125	-0.035	-0.016	-0.005	-0.133	-0.068	0.074	-0.011	-0.019	-0.056	-0.006	-0.006	0.055
34.17	-0.066	---	-0.258	-0.086	0.132	---	-0.040	-0.067	-0.167	---	0.076	---	-0.043	---	-0.101	-0.095	0.040	---
35.17	-0.061	-0.065	-0.066	-0.215	-0.059	0.164	-0.034	-0.005	-0.004	-0.064	0.060	0.002	-0.019	-0.050	-0.045	-0.085	-0.016	0.080
36.17	-0.023	-0.057	-0.052	-0.179	0.224	---	-0.006	-0.059	-0.044	-0.136	-0.066	0.139	-0.023	-0.066	-0.042	-0.074	-0.004	0.087
37.17	-0.016	-0.059	-0.080	-0.258	-0.065	0.164	-0.046	-0.059	-0.077	-0.174	-0.075	0.070	-0.018	-0.028	-0.060	-0.087	-0.007	0.088
38.15	-0.058	---	-0.258	-0.065	0.164	---	-0.046	-0.059	-0.077	-0.174	-0.075	0.070	-0.018	-0.028	-0.060	-0.087	-0.007	0.088
38.40	-0.058	---	-0.258	-0.065	0.164	---	-0.046	-0.059	-0.077	-0.174	-0.075	0.070	-0.018	-0.028	-0.060	-0.087	-0.007	0.088
38.65	-0.064	---	-0.258	-0.065	0.164	---	-0.046	-0.059	-0.077	-0.174	-0.075	0.070	-0.018	-0.028	-0.060	-0.087	-0.007	0.088
38.90	-0.075	---	-0.258	-0.065	0.164	---	-0.046	-0.059	-0.077	-0.174	-0.075	0.070	-0.018	-0.028	-0.060	-0.087	-0.007	0.088
39.15	-0.094	-0.151	-0.200	-0.290	-0.132	0.099	-0.079	-0.174	-0.220	-0.128	0.028	---	-0.057	-0.149	-0.161	-0.156	-0.074	0.026
$\alpha = 8^\circ$						$\alpha = 4^\circ$						$\alpha = 0^\circ$						
0.50	0.154	---	---	---	---	---	0.199	---	---	---	---	---	0.255	---	---	---	---	---
1.50	0.066	---	---	---	---	---	0.112	---	---	---	---	---	0.156	---	---	---	---	---
2.50	0.015	0.010	0.004	0.078	0.158	0.226	0.049	0.005	0.081	0.099	0.152	0.161	0.092	---	---	---	---	---
3.50	0.045	---	---	---	---	---	0.045	---	---	---	---	---	0.114	---	---	---	---	---
4.50	0.058	0.027	0.017	0.094	0.114	---	0.061	0.052	0.055	0.072	0.096	0.131	0.029	---	---	---	---	---
5.50	0.012	---	---	---	---	---	0.038	---	---	---	---	---	0.046	---	---	---	---	---
6.50	-0.007	-0.022	-0.055	-0.001	0.099	0.113	0.015	0.015	0.020	0.057	0.057	0.075	0.022	---	---	---	---	---
8.50	-0.022	-0.040	-0.057	-0.055	0.020	0.071	-0.005	-0.010	-0.009	0.001	0.019	0.058	0.015	---	---	---	---	---
10.50	-0.040	-0.059	-0.078	-0.058	0.046	0.046	-0.029	-0.034	-0.035	-0.024	-0.010	0.009	-0.014	---	---	---	---	---
12.50	-0.056	-0.051	-0.075	-0.065	0.025	0.029	-0.035	-0.038	-0.038	-0.035	-0.020	-0.002	-0.022	---	---	---	---	---
14.50	-0.065	-0.066	-0.114	-0.101	0.045	0.015	-0.049	-0.060	-0.063	-0.054	-0.051	-0.016	-0.022	---	---	---	---	---
16.50	-0.025	-0.075	-0.102	-0.115	-0.076	-0.026	-0.050	-0.056	-0.066	-0.074	-0.061	-0.040	-0.061	---	---	---	---	---
17.17	-0.062	---	---	---	---	---	-0.027	---	---	---	---	---	-0.071	---	---	---	---	---
18.17	-0.067	-0.082	-0.111	-0.115	-0.085	-0.056	-0.068	-0.071	-0.072	-0.074	-0.067	-0.055	-0.065	---	---	---	---	---
19.17	-0.057	---	---	---	---	---	-0.066	---	---	---	---	---	-0.046	---	---	---	---	---
20.17	-0.060	-0.067	-0.104	-0.105	-0.065	-0.017	-0.059	-0.063	-0.070	-0.065	-0.052	-0.039	-0.044	---	---	---	---	---
21.17	-0.029	-0.099	-0.089	-0.056	---	---	-0.037	---	-0.070	-0.051	-0.045	---	-0.041	---	---	---	---	---
22.17	-0.012	-0.041	-0.069	-0.062	-0.048	0.002	-0.024	-0.031	-0.057	-0.045	-0.055	-0.020	-0.041	---	---	---	---	---
23.17	-0.011	-0.057	-0.055	-0.047	---	---	-0.010	-0.026	-0.025	-0.025	-0.025	---	-0.015	---	---	---	---	---
24.17	0.003	-0.027	-0.060	-0.025	---	---	0.005	-0.004	-0.015	-0.022	-0.019	-0.015	-0.001	---	---	---	---	---
25.17	0.001	---	-0.047	-0.060	-0.029	---	-0.004	---	---	-0.021	-0.015	---	-0.001	---	---	---	---	---
26.17	---	-0.022	-0.045	---	0.024	---	---	-0.008	---	-0.017	---	---	-0.001	---	---	---	---	---
27.17	0.005	---	-0.051	-0.008	---	---	-0.007	---	-0.015	---	-0.005	0.000	0.002	---	---	---	---	---
28.17	0.005	-0.017	-0.042	---	0.053	---	-0.006	-0.009	---	-0.008	---	---	0.018	---	---	---	---	---
29.17	-0.001	---	-0.047	---	---	---	-0.007	---	---	---	---	---	0.001	---	---	---	---	---
30.17	-0.005	-0.024	-0.051	-0.019	0.027	0.001	-0.004	---	-0.009	-0.001	0.015	0.006	---	---	---	---	---	---
31.17	-0.002	---	-0.052	-0.020	---	---	0.015	---	---	-0.015	-0.005	---	0.000	---	---	---	---	---
32.17	0.004	0.005	-0.054	-0.029	0.019	0.019	0.012	0.046	---	-0.002	-0.007	0.004	0.005	---	---	---	---	---
33.17	0.059	---	---	---	---	---	0.045	---	---	---	---	---	0.056	---	---	---	---	---
34.17	0.067	0.042	0.059	0.042	0.047	0.068	0.052	0.025	0.026	0.052	0.045	0.065	0.070	---	---			

TABLE I.- Continued
PRESSURE DATA, CYLINDRICAL BODY

(x) $M = 1.15$

x, in.	Pressure coefficients of row -																	
	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 180^\circ$	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 180^\circ$	$\theta = 0^\circ$	$\theta = 45^\circ$	$\theta = 75^\circ$	$\theta = 105^\circ$	$\theta = 135^\circ$	$\theta = 180^\circ$
	$\alpha = 20^\circ$						$\alpha = 16^\circ$						$\alpha = 12^\circ$					
0.50	0.079	---	---	---	---	---	0.078	---	---	---	---	---	0.116	---	---	---	---	---
1.50	0.085	---	---	---	---	---	0.053	---	---	---	---	---	0.077	---	---	---	---	---
2.50	0.008	-0.096	-0.225	-0.080	0.219	0.475	0.006	-0.081	-0.104	0.002	0.209	0.585	0.019	-0.018	-0.086	0.050	0.182	0.300
3.50	0.012	---	---	---	---	---	0.029	---	---	---	---	---	0.029	---	---	---	---	---
4.50	0.005	-0.095	-0.250	-0.147	0.156	---	0.013	-0.056	-0.133	-0.093	0.158	---	0.013	-0.018	-0.040	0.005	0.121	---
5.50	-0.016	---	---	---	---	---	-0.004	---	---	---	---	---	0.002	---	---	---	---	---
6.50	-0.041	-0.111	-0.280	-0.206	0.069	0.584	-0.019	-0.089	-0.174	-0.109	0.077	0.251	-0.011	-0.053	-0.092	-0.040	0.069	0.280
8.50	-0.055	-0.134	-0.308	-0.244	0.021	0.274	-0.018	-0.089	-0.194	-0.147	0.050	0.200	-0.015	-0.058	-0.109	-0.073	0.055	0.158
10.50	-0.056	-0.155	-0.289	-0.294	-0.024	0.251	-0.058	-0.097	-0.208	-0.182	0.012	0.160	-0.027	-0.068	-0.126	-0.099	0.002	0.109
12.50	-0.070	-0.154	-0.248	-0.352	-0.051	0.196	-0.093	-0.097	-0.188	-0.196	-0.040	0.129	-0.071	-0.073	-0.132	-0.112	-0.017	0.087
14.50	-0.099	-0.170	-0.238	-0.356	-0.106	0.145	-0.105	-0.122	-0.252	-0.252	-0.065	0.089	-0.092	-0.078	-0.150	-0.131	-0.045	0.051
16.50	-0.087	-0.156	-0.211	-0.349	-0.117	0.129	-0.072	-0.117	-0.179	-0.265	-0.109	0.068	-0.095	-0.080	-0.146	-0.163	-0.068	0.046
17.17	-0.092	---	---	---	---	---	-0.061	---	---	---	---	---	-0.090	---	---	---	---	---
18.17	-0.094	-0.146	-0.173	-0.568	-0.156	0.109	-0.089	-0.122	-0.169	-0.251	-0.152	0.041	-0.065	-0.095	-0.147	-0.154	-0.069	0.012
19.17	-0.094	---	---	---	---	---	-0.081	---	---	---	---	---	-0.060	---	---	---	---	---
20.17	-0.084	-0.150	-0.150	-0.344	-0.147	0.105	-0.066	-0.115	-0.161	-0.228	-0.106	0.050	-0.065	-0.077	-0.145	-0.175	-0.090	0.009
21.17	-0.095	-0.155	-0.148	-0.308	-0.147	---	-0.068	---	-0.161	-0.235	-0.100	0.045	-0.065	-0.069	-0.128	-0.154	-0.090	0.002
22.17	-0.095	-0.145	-0.139	-0.280	-0.144	0.087	-0.066	-0.102	-0.142	-0.250	-0.107	0.055	-0.067	-0.069	-0.112	-0.145	-0.076	0.015
23.17	-0.069	-0.126	-0.126	-0.268	-0.124	---	-0.050	-0.117	-0.219	-0.115	---	---	-0.019	---	-0.099	-0.130	-0.075	---
24.17	-0.061	-0.117	---	-0.261	-0.109	0.105	-0.042	-0.082	---	-0.201	-0.095	0.075	-0.021	-0.077	---	-0.128	-0.065	0.014
25.17	-0.071	---	---	-0.265	-0.089	---	-0.041	---	-0.189	-0.095	---	---	-0.027	---	-0.060	-0.129	-0.068	---
26.17	---	-0.104	---	-0.251	---	0.125	---	-0.074	-0.175	---	---	0.062	---	-0.054	---	-0.114	---	0.025
27.17	-0.065	-0.113	-0.113	-0.255	-0.080	---	-0.029	-0.085	-0.179	---	0.072	---	-0.050	---	---	-0.107	-0.047	---
28.17	-0.058	-0.102	-0.111	-0.248	---	0.125	-0.056	-0.071	-0.177	---	---	0.068	-0.025	-0.047	---	-0.107	---	0.057
29.17	-0.058	---	---	-0.265	---	---	-0.041	---	-0.165	---	---	---	-0.040	---	---	-0.102	---	---
30.17	-0.055	-0.090	---	-0.250	-0.087	---	-0.040	-0.065	-0.155	-0.057	0.088	---	-0.056	-0.050	---	-0.102	-0.054	0.045
31.17	-0.050	-0.096	-0.096	-0.255	-0.076	---	-0.050	-0.068	-0.151	-0.041	---	---	-0.061	---	---	-0.102	-0.028	---
32.17	-0.055	-0.089	-0.095	-0.259	-0.080	0.139	-0.046	-0.097	-0.157	-0.056	0.094	---	-0.017	-0.047	---	-0.109	-0.042	0.051
33.17	-0.045	---	---	---	---	---	-0.041	---	---	---	---	---	-0.039	---	---	---	---	---
34.17	-0.045	-0.074	-0.061	-0.245	-0.100	0.126	-0.046	-0.066	-0.082	-0.178	-0.071	0.076	-0.018	-0.055	-0.060	-0.118	-0.041	0.052
35.17	-0.045	---	---	---	---	---	-0.044	---	---	---	---	---	-0.007	---	---	---	---	---
36.17	-0.046	-0.057	-0.058	-0.215	-0.091	0.127	-0.056	-0.062	-0.082	-0.180	-0.081	0.075	0.005	-0.012	-0.053	-0.095	-0.057	0.059
37.17	-0.034	---	---	---	---	---	-0.056	---	---	---	---	---	0.005	---	---	---	---	---
38.15	-0.056	-0.061	-0.044	-0.175	-0.062	---	-0.055	-0.065	-0.069	-0.161	-0.082	0.062	0.012	-0.015	-0.020	-0.055	-0.058	0.054
38.40	-0.056	---	---	---	---	---	-0.054	---	---	---	---	---	0.022	---	---	---	---	---
38.65	-0.057	---	---	---	---	---	-0.055	---	---	---	---	---	0.017	---	---	---	---	---
38.90	-0.061	---	---	---	---	---	-0.054	---	---	---	---	---	-0.001	---	---	---	---	---
39.15	-0.075	-0.160	-0.149	-0.195	-0.098	0.102	-0.057	-0.154	-0.160	-0.188	-0.102	0.057	-0.026	-0.125	-0.127	-0.114	-0.058	0.015
$\alpha = 8^\circ$																		
0.50	0.149	---	---	---	---	---	0.205	---	---	---	---	---	0.291	---	---	---	---	---
1.50	0.089	---	---	---	---	---	0.122	---	---	---	---	---	0.182	---	---	---	---	---
2.50	0.058	0.052	0.045	0.094	0.170	0.240	0.079	0.068	0.105	0.115	0.145	0.172	0.106	---	---	---	---	---
3.50	0.054	---	---	---	---	---	0.069	---	---	---	---	---	0.088	---	---	---	---	---
4.50	0.012	0.012	0.011	0.055	0.118	---	0.042	0.042	0.048	0.068	0.095	0.122	0.067	---	---	---	---	---
5.50	0.015	---	---	---	---	---	0.014	---	---	---	---	---	0.065	---	---	---	---	---
6.50	-0.005	-0.016	-0.052	-0.002	0.099	0.119	0.016	0.007	0.006	0.024	0.044	0.076	0.046	---	---	---	---	---
8.50	-0.015	-0.051	-0.049	-0.022	0.052	0.088	-0.005	-0.001	-0.001	0.014	0.051	0.050	0.015	---	---	---	---	---
10.50	-0.025	-0.046	-0.067	-0.048	0.002	0.059	-0.016	-0.022	-0.022	-0.009	0.009	0.051	0.000	---	---	---	---	---
12.50	-0.050	-0.048	-0.075	-0.065	-0.019	0.054	-0.020	-0.025	-0.029	-0.025	-0.013	0.005	-0.015	---	---	---	---	---
14.50	-0.059	-0.055	-0.082	-0.078	-0.056	0.009	-0.051	-0.040	-0.045	-0.040	-0.027	-0.017	-0.027	---	---	---	---	---
16.50	-0.045	-0.074	-0.099	-0.088	-0.056	0.010	-0.057	-0.047	-0.047	-0.057	-0.020	-0.017	-0.025	---	---	---	---	---
17.17	-0.056	---	---	---	---	---	-0.045	---	---	---	---	---	-0.018	---	---	---	---	---
18.17	-0.052	-0.069	-0.115	-0.117	-0.071	-0.016	-0.046	-0.062	-0.077	-0.075	-0.051	-0.020	-0.044	---	---	---	---	---
19.17	-0.058	---	---	---	---	---	-0.057	---	---	---	---	---	-0.056	---	---	---	---	---
20.17	-0.049	-0.097	-0.090	-0.108	-0.081	-0.051	-0.046	-0.045	-0.051	-0.056	-0.055	-0.046	-0.061	---	---	---	---	---
21.17	-0.041	-0.087	-0.075	-0.062	-0.052	---	-0.051	---	-0.062	-0.045	-0.050	---	-0.044	---	---	---	---	---
22.17	-0.042	-0.067	-0.091	-0.077	-0.045	-0.008	-0.046	-0.057	-0.055	-0.041	-0.028	-0.026	-0.024	---	---	---	---	---
23.17	-0.022	-0.095	-0.095	-0.088	-0.050	---	-0.027	-0.097	-0.097	-0.046	-0.033	---	-0.025	---	---	---	---	---
24.17	-0.016	-0.045	---	-0.091	-0.055	-0.005	-0.017	-0.028	-0.047	-0.049	-0.059	-0.019	-0.054	---	---	---	---	---
25.17	-0.015	---	-0.061	-0.054	-0.056	---	-0.019	---	---	-0.059	-0.040	---	-0.042	---	---	---	---	---
26.17	---	-0.052	---	-0.060	---	-0.009	---	-0.022	---	-0.050	---	-0.026	---	---	---	---	---	---
27.17	-0.004	---	---	-0.050	-0.030	---	-0.013	---	-0.024	---	-0.018	---	-0.007	---	---	---	---	---
28.17	-0.001	-0.026	---	-0.057	---	0.014	-0.009	-0.014	---	-0.019	---	0.005	-0.002	---	---	---	---	---
29.17	-0.002	---	---	-0.052	---	---	-0.008	---	---	---	---	---	-0.004	---	---	---	---	---
30.17	-0.001	-0.024	---	-0.055	-0.027	0.015	-0.004	-0.009	---	-0.012	-0.006	0.009	0.002	---	---	---	---	---
31.17	-0.005	---	---	-0.047	-0.018	---	-0.009	---	---	-0.014	-0.006	---	0.000	---	---	---	---	---
32.17	-0.012	-0.024	---	-0.041	-0.011	0.052	-0.015	-0.017	---	-0.017	-0.008	0.008	-0.002	---	---	---	---	---
33.17	-0.017	---	---	---	---	---	-0.017	---	---	---	---	---	-0.002	---	---	---	---	---
34.17	-0.019	-0.050	-0.040	-0.047	-0.012	0.054	-0.015	-0.024	-0.027	-0.022	-0.004	0.015	0.002	---	---	---	---	---
35.17	-0.009	---	---	---	---	---	-0.009	---	---	---	---	---	-0.010	---	---	---	---	---
36.17	-0.014	-0.025	-0.043	-0.065	-0.052	0.021	-0.010	-0.012	-0.014	-0.018	-0.010	0.007	-0.018	---	---	---	---	---
37.17	-0.018	---	---	---	---	---	-0.008	---	---	---	---	---	-0.001	---	---	---	---	---
38.15	-0.011	-0.025	-0.058	-0.061	-0.040	-0.005												

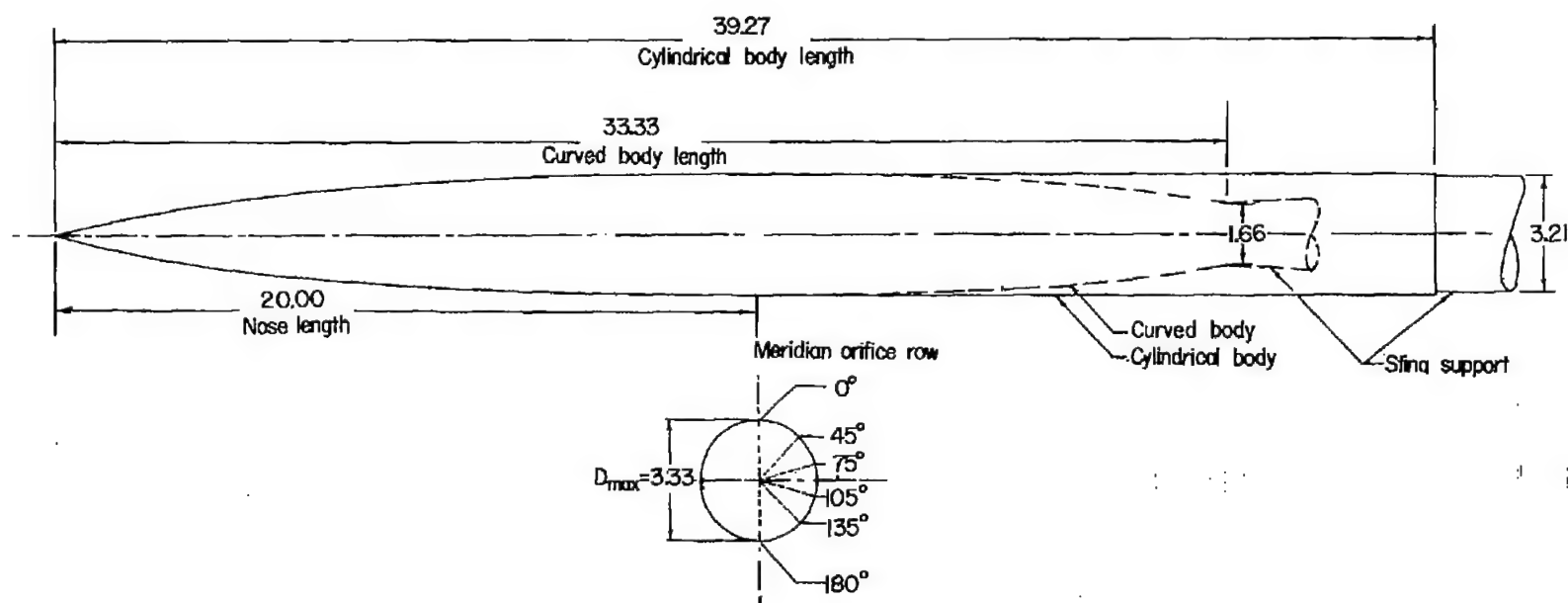


Figure 1.- Body details. (Linear dimensions in inches.)

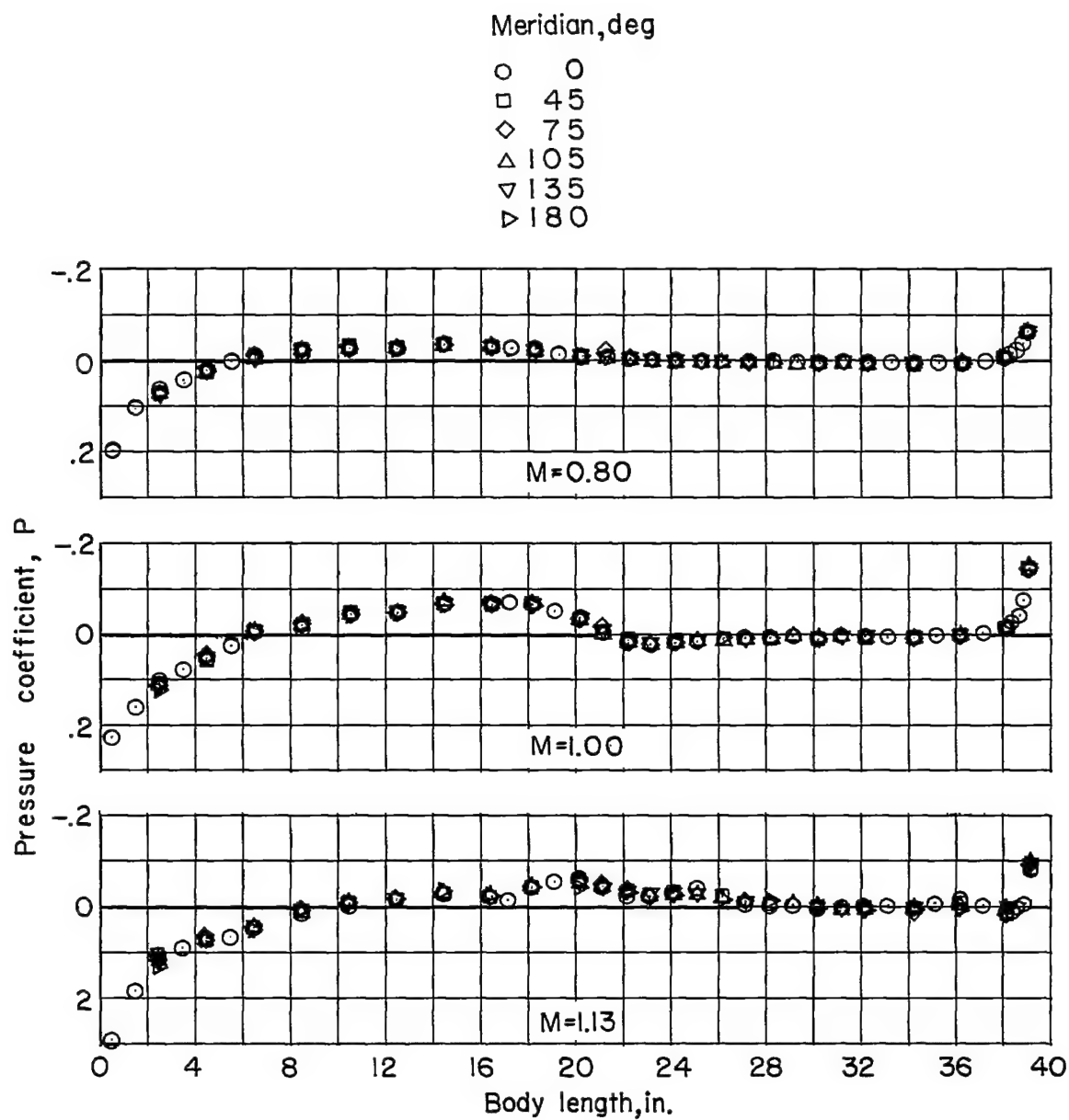


Figure 2.- Accuracy of pressure measurements. $\alpha = 0^\circ$.

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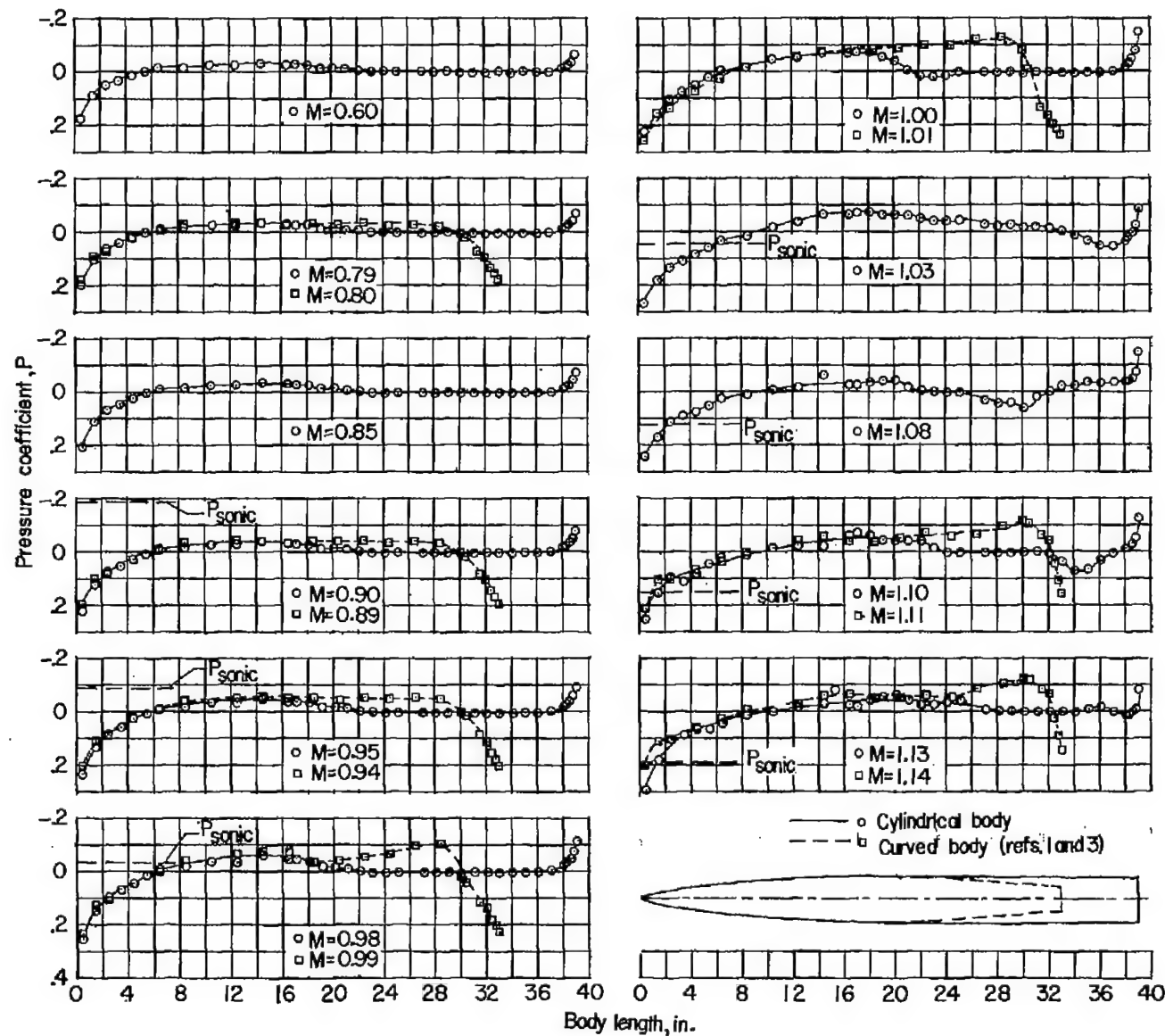


Figure 3.- Longitudinal pressure distribution at zero angle of attack.

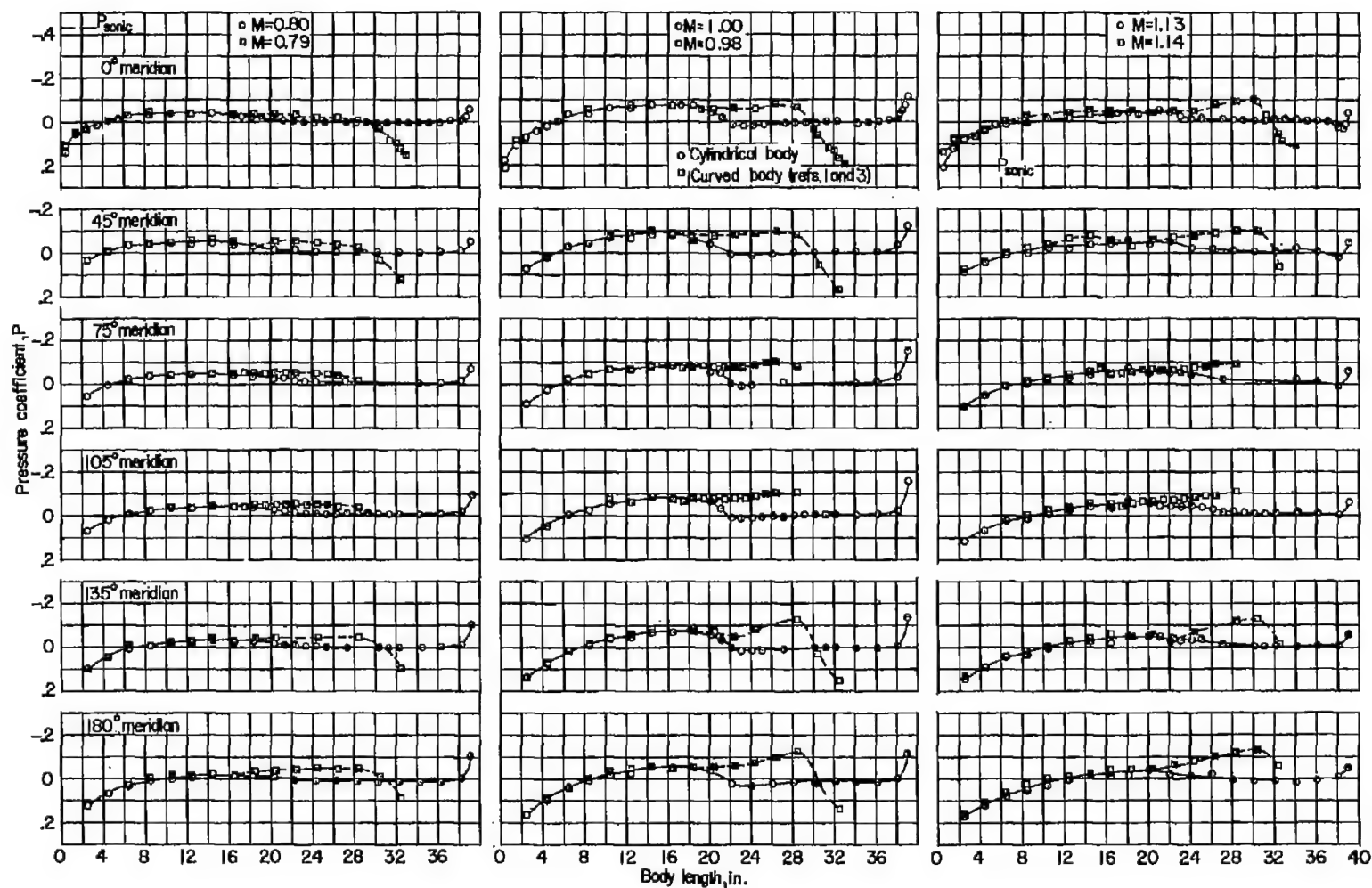
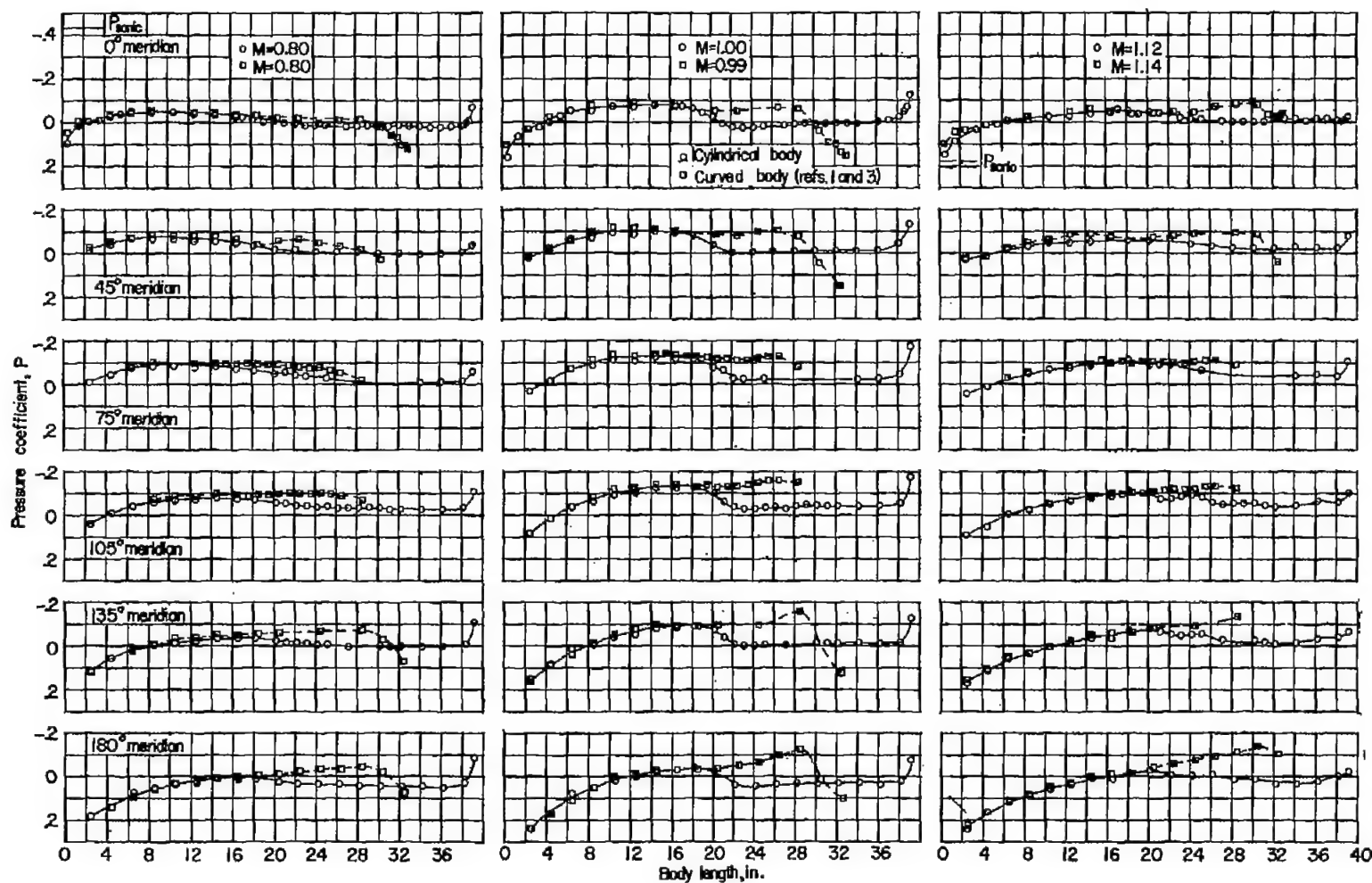
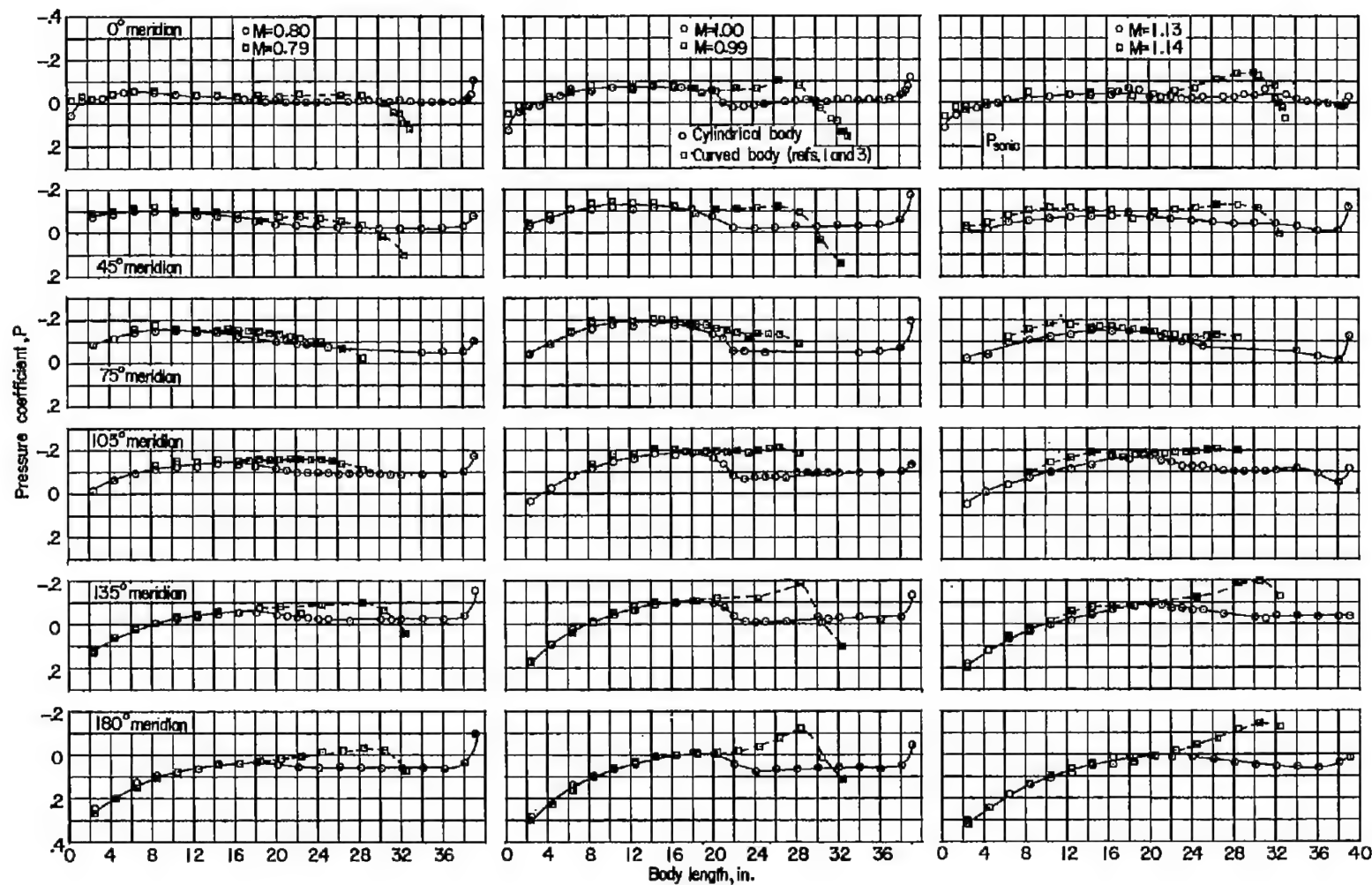
(a) $\alpha = 4^\circ$.

Figure 4.- Longitudinal pressure distribution at six radial stations.



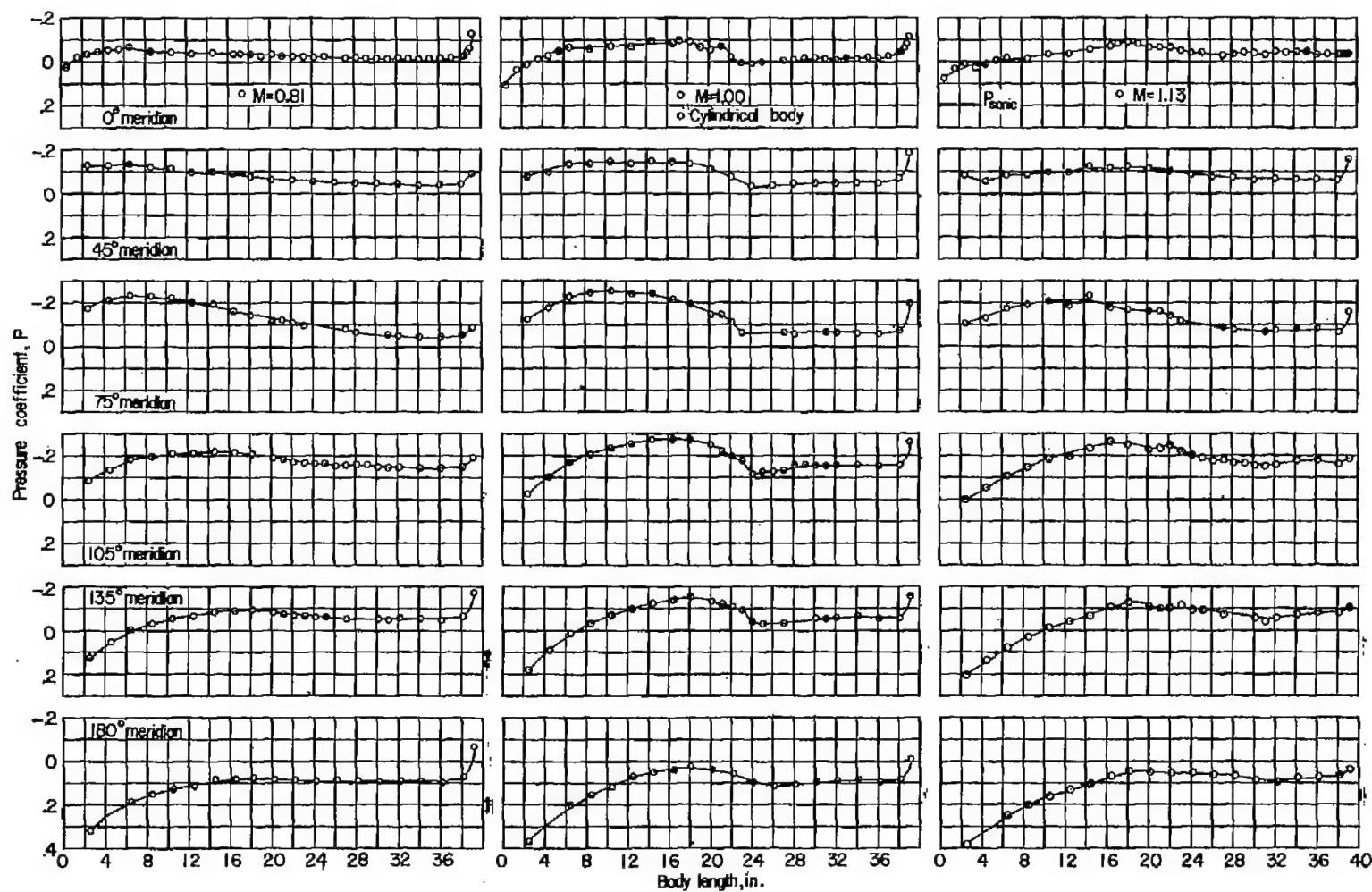
(b) $\alpha = 8^\circ$.

Figure 4.- Continued.



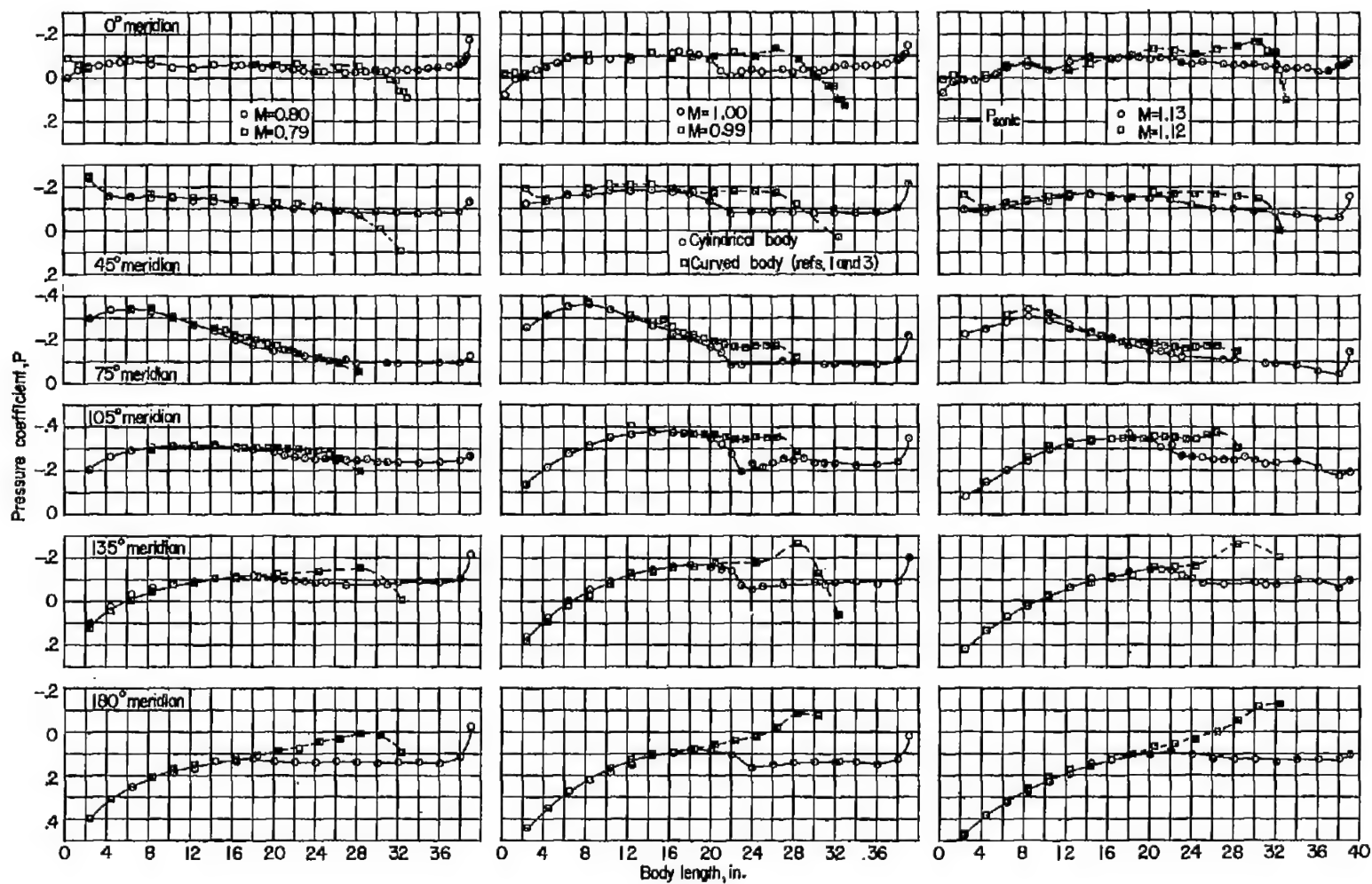
(c) $\alpha = 12^\circ$.

Figure 4.- Continued.



(d) $\alpha = 16^\circ$.

Figure 4.- Continued.



(e) $\alpha = 20^\circ$.

Figure 4.- Concluded.

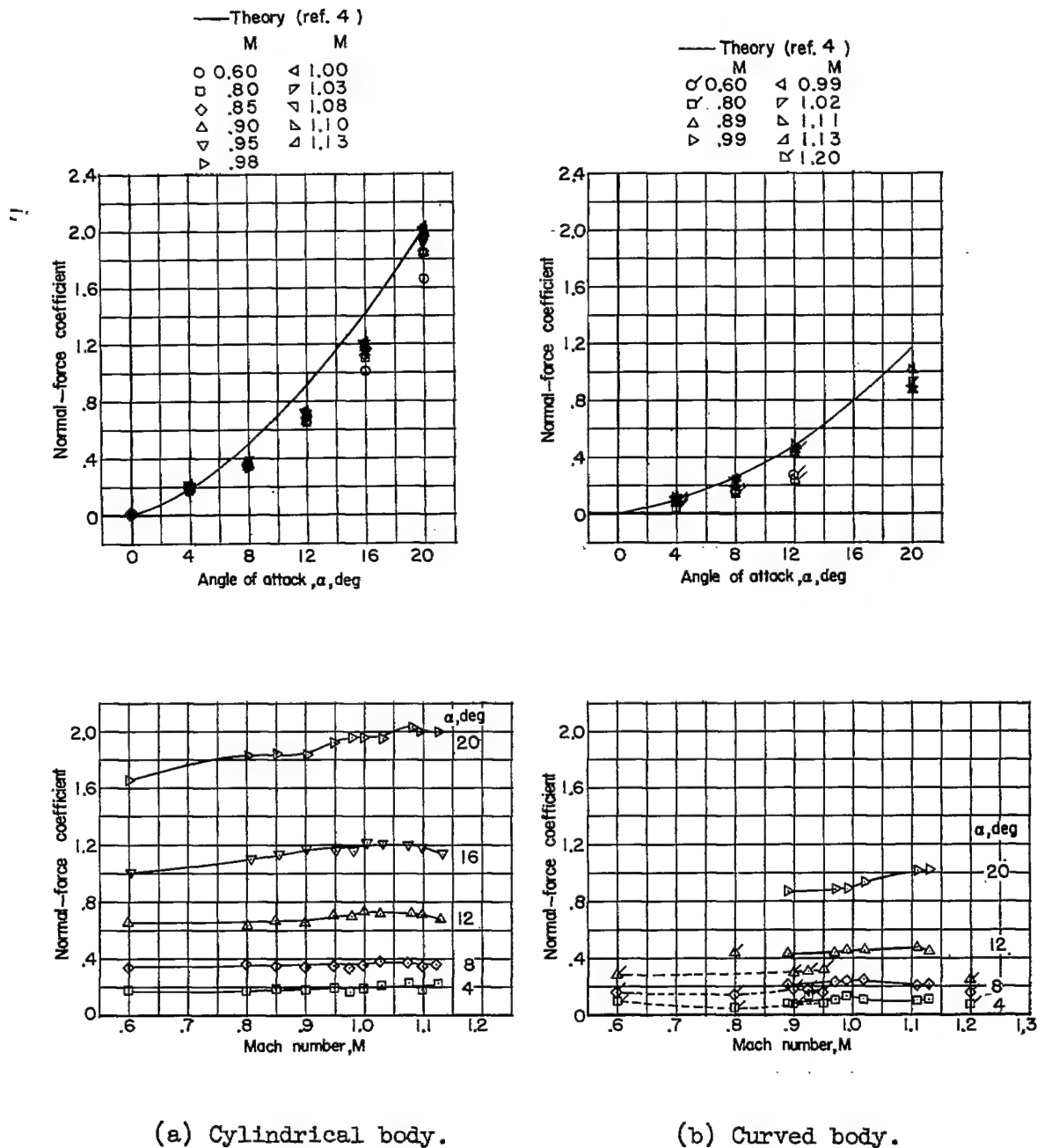
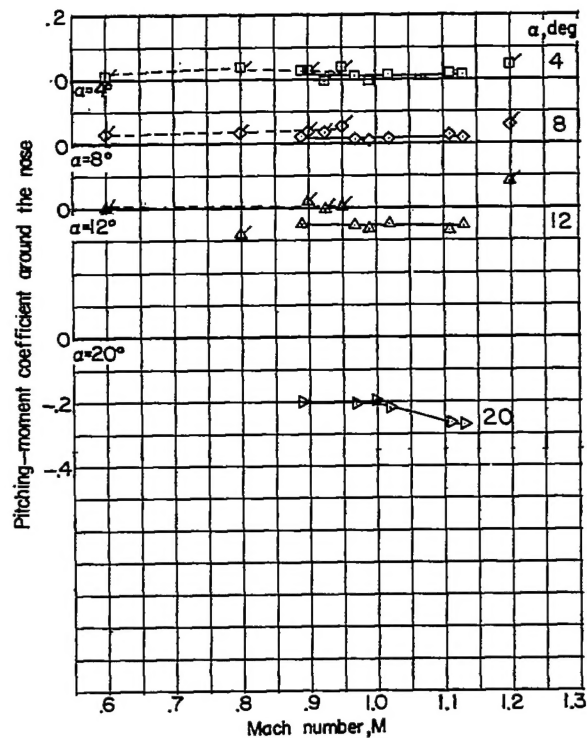
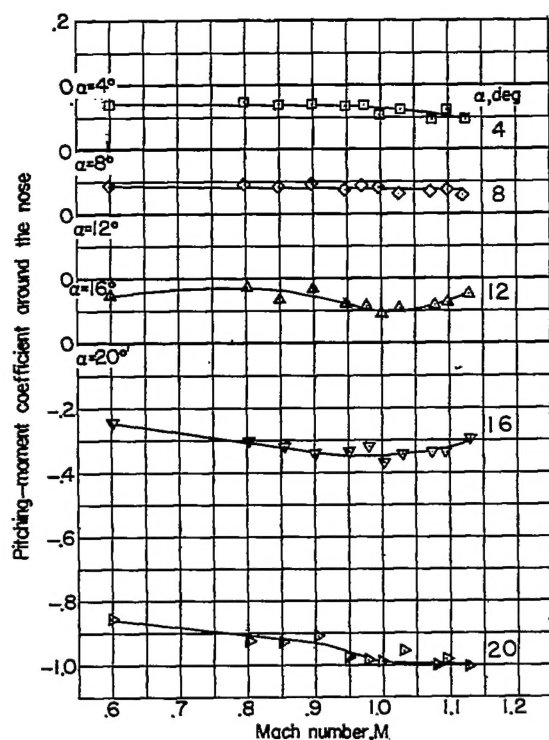
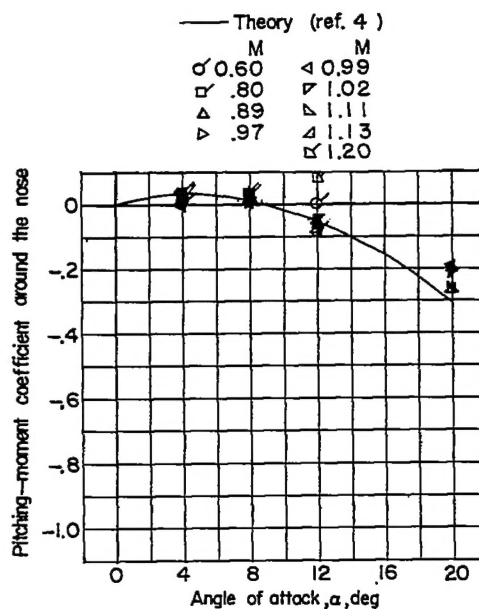
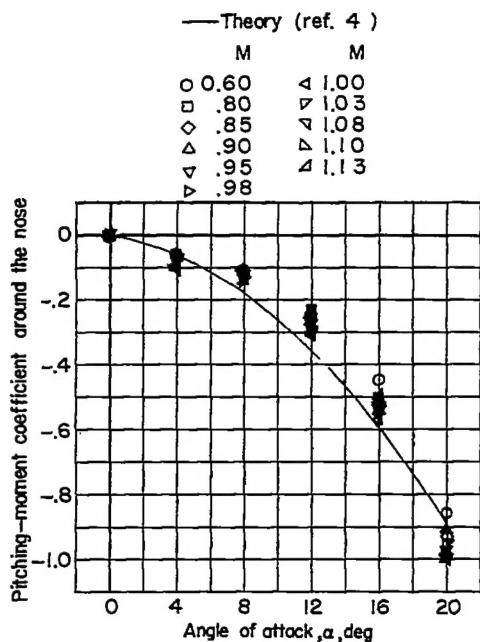


Figure 5.- Comparison of normal-force coefficients. (Flagged symbols represent data from closed-throat tunnel; unflagged symbols represent data from slotted-throat tunnel.)



(a) Cylindrical body.

(b) Curved body.

Figure 6.- Comparison of pitching-moment coefficients. (Flagged symbols represent data from closed-throat tunnel; unflagged symbols represent data from slotted-throat tunnel.)

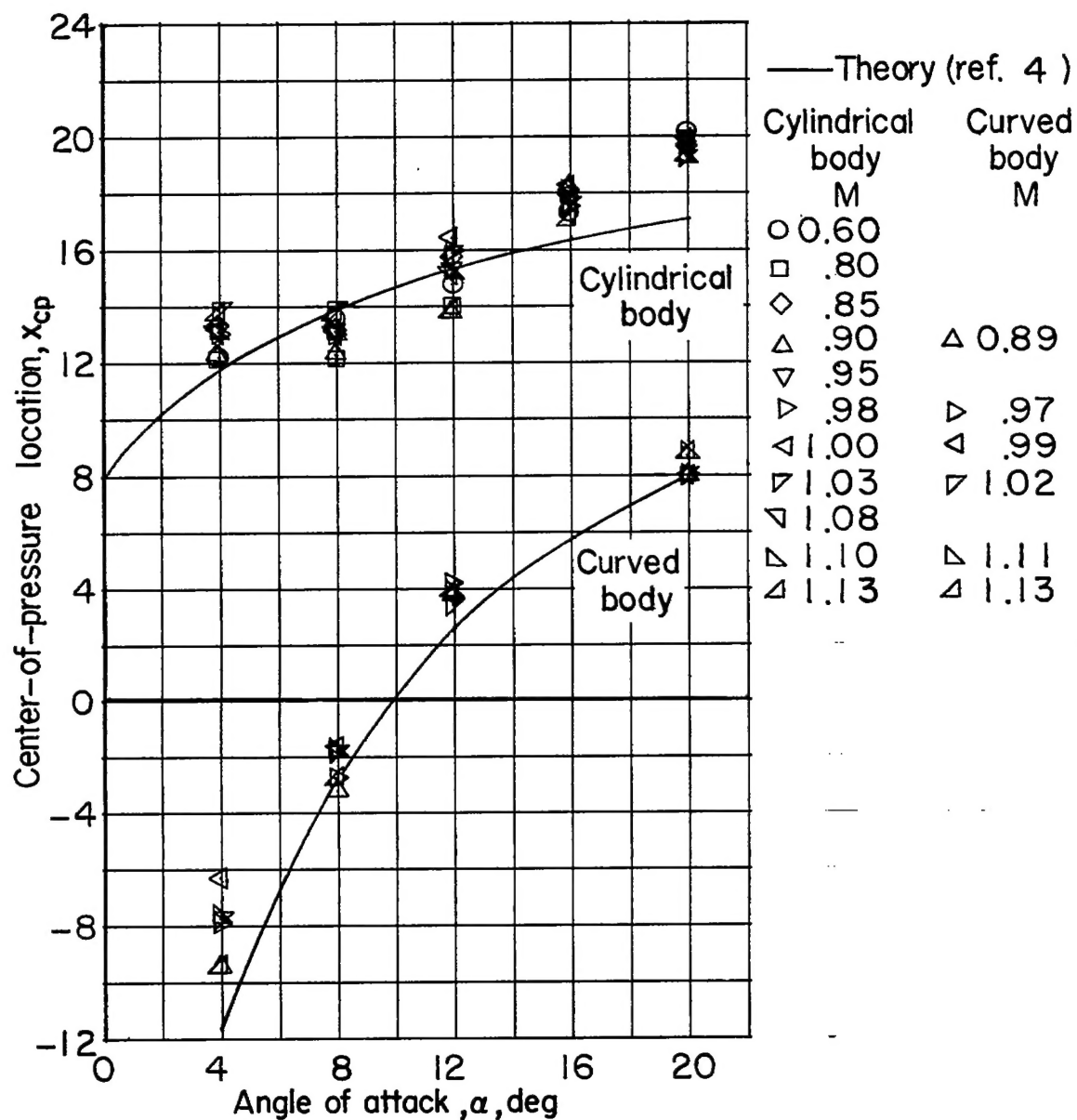


Figure 7.- Comparison of center-of-pressure locations.

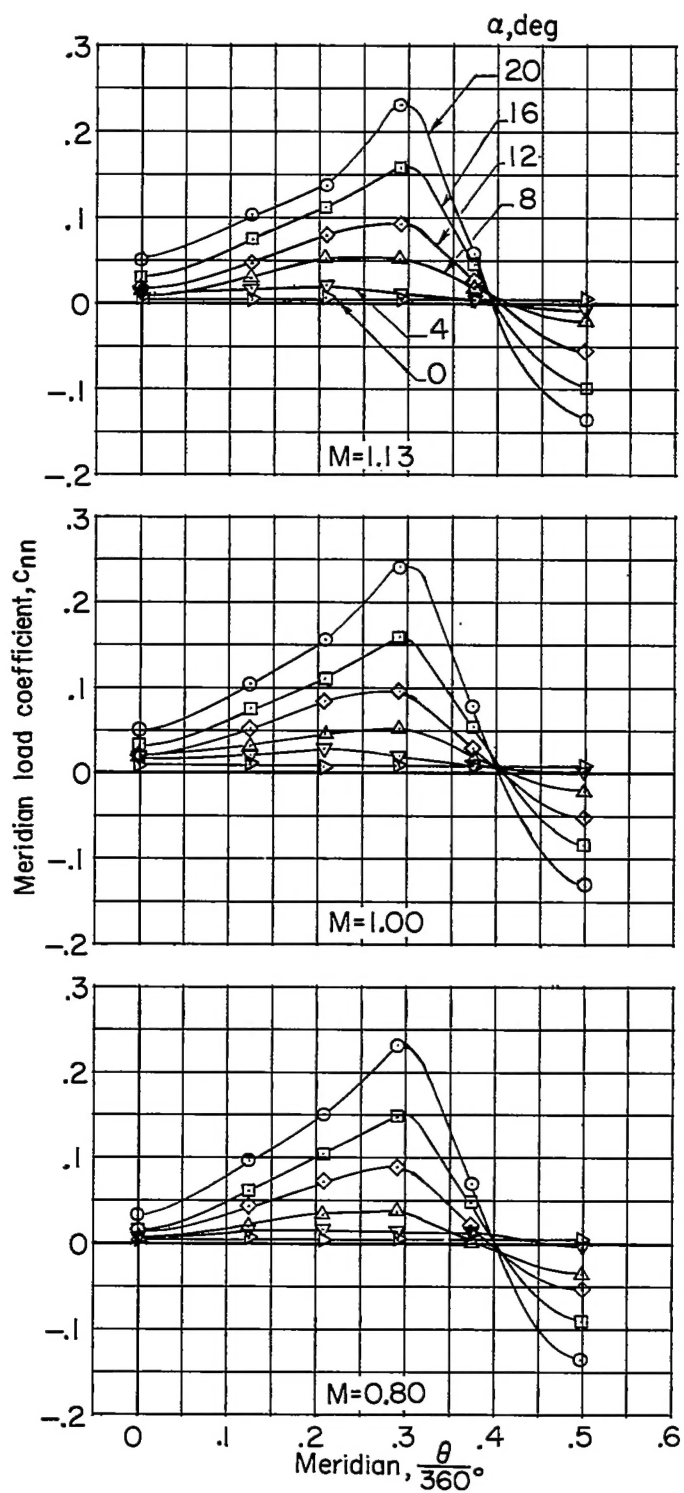
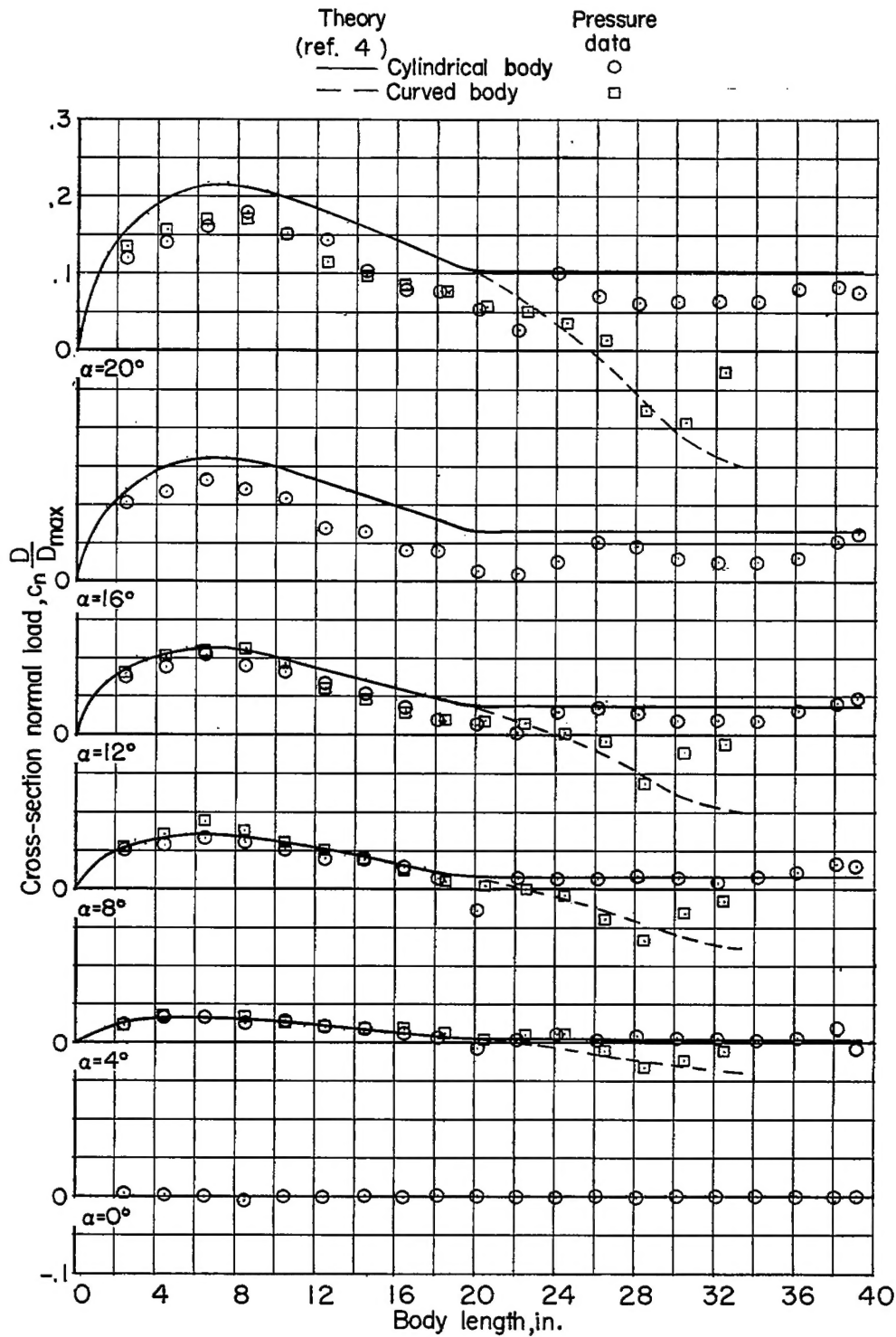


Figure 8.- Meridian load coefficient. Cylindrical body.

Figure 9.- Comparison of cross-section normal loads. $M = 1.00$.